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Open File Report 6162

A New Metamorphic Framework for Gold Exploration in the Timmins–Kirkland Lake Area, Western Abitibi Greenstone Belt: Discover Abitibi Initiative

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A New Metamorphic Framework for Gold Exploration in the Timmins–Kirkland Lake Area, Western Abitibi Greenstone Belt: Discover Abitibi Initiative

by

P.H. Thompson

2005

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A project of innovation, cooperation and revitalization

Découvrons l' Abitibi
Un projet d'innovation, de coopération et de renouvellement

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L'initiative Découvrons l'Abitibi est un project de développment économique régional dans une grappe d'industries, projet fondé sur des études géoscientifiques de la ceinture de roches vertes de l'Abitibi occidental. Cette initiative, centrée sur les zones minières de Kirkland Lake et de Timmins, mènera à bien 19 projets élaborés et dirigés par des intervenants locaux. FedNor, la Société de gestion du Fonds du patrimoine du Nord de l'Ontario, municipalités et des investisseurs du secteur privé ont fourni les fonds de cette initiative.

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Digital Compilation of Maps and Data from the Greenstone Architecture Project: Discover Abitibi Initiative; by J.A. Ayer, P.C. Thurston, R. Bateman, H.L. Gibson, M.A. Hamilton, B. Hathaway, S.M. Hocker, G. Hudak, B. Lafrance, V. Ispolatov, P.J. MacDonald, A.S. Péloquin, S.J. Piercey, L.E. Reed, P.H. Thompson and H. Izumi. This digital release on DVD will contain a digital version of the Metamorphic Map of the Timmins–Kirkland Lake Area, Western Abitibi Greenstone Belt (Figure 2 of this report, see back pocket), and the petrographic data table (file name *tkldats2.dbf*; Table 1 of this report, see Appendix 2).

This DVD is available separately from this report.

Abstract

The Metamorphic Subproject of the Greenstone Architecture Project, Discover Abitibi Initiative, is designed to address a significant gap in knowledge of the geological setting of gold deposits and of the application of metamorphic data and concepts to gold exploration in the Timmins–Kirkland Lake area. There are three reasons why this gap should be filled. First, some metamorphic zone boundaries may be themselves valid gold exploration targets (Hall 1998, using data from Mikucki and Roberts 2004; Thompson 2002, 2003, in press (2005)). Second, metamorphic data and the concepts developed to explain the origin of metamorphic rocks impose constraints on the geological setting of gold deposits and the mineralization and alteration therein. Third, this project provides a basis for comparison of the metamorphic settings of the Timmins and Kirkland Lake gold camps with each other and with the, up to now, less productive adjacent parts of the greenstone belt. Map-scale variations of metamorphic grade combined with textures and mineral assemblages are the basis for analysis and interpretation of the spatial and temporal relationships between metamorphism and magmatism, deformation, alteration, and gold mineralization. The resulting metamorphic framework advances knowledge of known gold deposits and helps to define new exploration targets.

Subdivision of the greenschist zone using the appearance of biotite in metamorphosed quartzofeldspathic and aluminous rocks and the appearance of amphibole in metamorphosed ultramafic rocks reveals a striking spatial relationship between the metamorphic zone boundary and a significant number of past and presently producing gold mines. Higher priority targets are defined by the coincidence of metamorphic anomalies defined by the boundary with major structural features, particular rock compositions, and moderate to intense deformation and/or alteration. For example, in Tully, Prosser, and Wark townships, a lenticular zone of upper greenschist grade rocks surrounded by lower greenschist zone rocks is associated with a northeast-trending fault zone, a small alkalic pluton and, at the northeast end, numerous gold occurrences. On a smaller scale, the linear array of metamorphic "hot" spots located between two branches of the Destor–Porcupine fault in Whitney Township may be significant. A more detailed examination of the relationship between a metamorphic anomaly and the Dome mine raises the possibility that metamorphic anomalies indicate which segment of a regional scale deformation or alteration zone has the highest potential to contain a large gold deposit. One of the two small metamorphic anomalies mapped along the Pipestone Fault in Stock Township is spatially associated with the Clavos mine.

The irregular metamorphic pattern in the project area is attributed to superposition of regional subgreenschist and greenschist grade regional metamorphism on narrow higher grade contact metamorphic aureoles that formed at different times immediately adjacent to felsic porphyries, felsic to intermediate granitoids and alkalic intrusions. The metamorphosed plutonic, volcanic and sedimentary rocks now at the surface reached maximum pressures (depths of 10 km) and temperatures (350 to 450°C) during the main phase of ductile deformation that occurred after deposition of the Timiskaming assemblage. Metamorphic data are consistent with the idea that the pre-Timiskaming phase of deformation was less penetrative and occurred at shallower depths and lower temperatures in the crust.

Metamorphic mineral assemblages indicate that rocks in the study area were well within the range of temperature and pressure that is favourable for gold deposition for tens of millions of years. Clearly, the period when peak metamorphic conditions prevailed and the predominant second phase of ductile deformation was in progress was the most conducive for synmetamorphic (orogenic) gold mineralization. At this time, metamorphic fluid production was at a maximum and ongoing deformation increased the potential for formation of structural conduits and traps. However, in view of the metamorphic data indicating pre-metamorphic ages for most of the intrusive plutonic rocks that are prominent in the

southwest half of the project area, perhaps gold exploration models related to granite- and porphyry-related gold should be considered in this part of the area.

A regional scale project of this kind must balance the conflicting demands of covering the designated area and of obtaining a data density adequate to define reasonably well-constrained metamorphic exploration targets. Definition of many of the metamorphic anomalies with gold potential that are outlined on the metamorphic map of Timmins–Kirkland Lake area (in back pocket) can and should be improved with additional sampling in key target areas. More complete analysis and interpretation of the spatial relationships between the intensity of strain, the type and intensity of alteration, and metamorphic zone boundaries is required. Future work should address also the low density or absence of data in the northwest, south-central and northeast sectors of the map presented here and extend metamorphic mapping to the north and southwest in Ontario and eastward into Quebec.

A New Metamorphic Framework for Gold Exploration in the Timmins–Kirkland Lake Area, Western Abitibi Greenstone Belt: Discover Abitibi Initiative

Peter H. Thompson[1]

Ontario Geological Survey
Open File Report 6162
2005

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[1] Peter H. Thompson Geological Consulting Ltd.
pthompson@synapse.net

Introduction

The Metamorphic Subproject of the Greenstone Architecture Project, Discover Abitibi Initiative, is designed to address a significant gap in knowledge of the geological setting of gold deposits and of the application of metamorphic data and concepts to gold exploration in the Timmins–Kirkland Lake area. At 1:200 000 scale, the new metamorphic map (Figure 2, back pocket; digital version in Ayer, Thurston, Bateman, Gibson et al. 2005 (Miscellaneous Release—Data 155)) provides a perspective intermediate between that provided by Jolly's (1978) map of the entire Abitibi greenstone belt (scale: 1:3 750 000) and a more recent compilation by Easton and Berman (2004, scale 1:1 500 000) and the small number of detailed studies (e.g., Jolly 1974; Powell et al. 1993) completed in the project area. The metamorphic knowledge gap should be addressed at an intermediate scale for three reasons. First, some metamorphic zone boundaries may be themselves valid gold exploration targets (Hall 1998, using data from Mikucki and Roberts 2004; Thompson 2002, 2003, in press (2005)). Second, metamorphic data and the concepts developed to explain the origin of metamorphic rocks impose constraints on the geological setting of gold deposits and on the mineralization and alteration that formed them. Third, this project provides a basis for comparison of the metamorphic settings of the Timmins and Kirkland Lake gold camps with each other and with the, up to now, less productive adjacent parts of the greenstone belt.

Extending across approximately 12 500 km^2 from west and northwest of Timmins to south and east of Kirkland Lake (Figure 1), the metamorphic map (Figure 2, in back pocket) is based on petrographic data from 2373 thin sections (Table 1, Appendix 2). Metamorphic zone boundaries are represented by solid lines for clarity, but the uneven density of data points means that control on the boundaries varies from good to poor. Map-scale variations of metamorphic grade combined with textures and mineral assemblages are used to analyze spatial and temporal relationships between metamorphism and magmatism, deformation, alteration, and gold mineralization. The resulting metamorphic framework advances knowledge of known gold deposits and helps to define new exploration targets.

Given the time frame and mandate of the Discover Abitibi Metamorphic Subproject, this report focuses on presentation and analysis of new metamorphic data, that is, filling this knowledge gap. The proposed relationships between metamorphism, deformation, magmatism and mineralization in the Timmins–Kirkland Lake segment of the Abitibi greenstone belt are preliminary in nature and remain to be tested against a comprehensive review of the extensive literature that is available for these other processes. As is often the case in geology, the language of applied metamorphic petrology is not static. Terminology changes with time and, to some degree, from author to author. The brief glossary (Appendix 1) ensures that the reader familiar with metamorphic petrology is aware of the terminology used here, and serves as an introduction to readers new to applied metamorphic petrology.

The report's accompanying map (Figure 2, in back pocket) and database (Appendix 2, includes legend for symbols in database) are available on the DVD produced by the Discover Abitibi Initiative (Miscellaneous Release—Data 155: Ayer, Thurston, Bateman, Gibson et al. 2005), available separately from this report).

Acknowledgments

The study could not have been done without the assistance of government and company geologists and Discover Abitibi Initiative colleagues who took the time to find, pack and ship thin sections and/or samples and location data to my office (B. Atkinson, J. Ayer, E. Barr, R. Bateman, B. Berger, L. Hall,

B. Hathway, M. Houlé, V. Ispolatov, G. Meyer, T. Muir, S. Peloquin, Frank Santaguida). The Timmins West metamorphic pilot project, an essential precursor to the current study, received logistical and intellectual support from Greg Hall (Placer Dome) and Richard Keele (formerly Placer Dome) and John Ayer (Ontario Geological Survey). George Mzarek, Department of Earth Sciences, University of Ottawa provided first class thin sections. Invaluable technical assistance from Henrique Izumi ensured that an accessible digital metamorphic map is part of this report. Financial and logistical support for Discover Abitibi Initiative from the Ontario Geological Survey, Porcupine Joint Venture, Falconbridge, Laurentian University, Timmins Economic Development Corporation, Northern Ontario Heritage Fund Corporation and FedNor Canada is much appreciated. Critical review by John Ayer and Marg Rutka's editing skills improved this report.

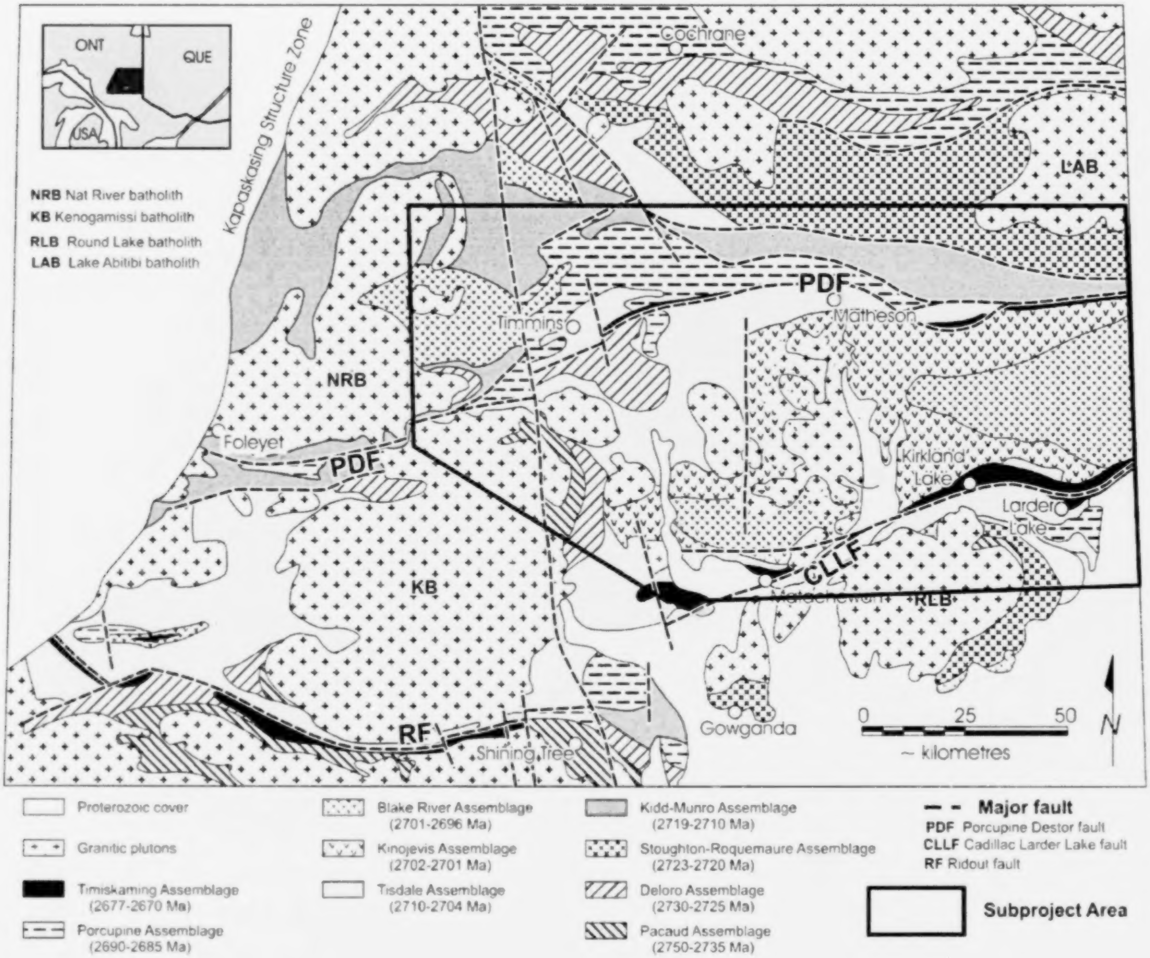
ONT
QUE
USA
Kapaskasing Structure Zone
NRB Nat River batholith
KB Kenogamissi batholith
RLB Round Lake batholith
LAB Lake Abitibi batholith
Cochrane
LAB
PDF
Matheson
Timmins
NRB
Foleyet
PDF
Kirkland Lake
Larder Lake
CLLF
Matachewan
RLB
KB
RF
Shining Tree
Gowganda
0
25
50
N
~ kilometres
Proterozoic cover
Granitic plutons
Timiskaming Assemblage (2677-2670 Ma)
Porcupine Assemblage (2690-2685 Ma)
Blake River Assemblage (2701-2696 Ma)
Kinojevis Assemblage (2702-2701 Ma)
Tisdale Assemblage (2710-2704 Ma)
Kidd-Munro Assemblage (2719-2710 Ma)
Stoughton-Roquemaure Assemblage (2723-2720 Ma)
Deloro Assemblage (2730-2725 Ma)
Pacaud Assemblage (2750-2735 Ma)
Major fault
PDF Porcupine Destor fault
CLLF Cadillac Larder Lake fault
RF Ridout fault
Subproject Area

Figure 1. Location of the Metamorphic Subproject area. Geology after Ayer et al. (2002).

Methodology

PETROGRAPHY

Reconnaissance petrography of 2373 thin sections (including 341 from Thompson (2002)) is the basis for classification of the samples into eight rock associations (generalized rock types), for estimates of the grade of the predominant metamorphic event in each sample, for qualitative observations of the intensity of deformation, and, where possible, for qualitative observations of the type and intensity of alteration. This information is compiled in Table 1 (Appendix 2) and is also accessible directly on the digital version of the map in MRD 155. Thin sections were obtained from Ontario Geological Survey collections in Sudbury, Timmins, and Kirkland Lake, from the Porcupine Joint Venture and Falconbridge, and from samples collected by the author.

ROCK ASSOCIATIONS

The sample suite is divided into 7 metamorphic rock associations and an unmetamorphosed granitoid rock association (Table 2). Metabasites (35%), metaquartzofeldspathic rocks (32%), metamorphosed carbonate-rich rocks (11%), and meta-ultramafites (9%) make up most of the sample suite, with metamorphosed aluminum-rich rocks (6%), metagranitoids (6%) and chemical metasedimentary rocks (1%) less prominent. Only two samples were interpreted to be unmetamorphosed granitoids. Each association represents a particular range of rock composition that reacts in a distinctive way to increasing metamorphic conditions. For example, whereas the transition from greenschist to amphibolite zone in pelitic rocks (rock association 4, Table 2) is typically mappable as a line in metamorphic terranes, in metabasites (rock association 1), the change commonly involves a transition zone containing characteristics of both greenschist and amphibolite zones (Bucher and Frey 1994; Spear 1993). Although not yet accurately calibrated, the appearance of amphibole in metamorphosed ultramafic rocks (rock association 3, Table 2) corresponds approximately with the appearance of biotite in rock associations 2 and 4. Documentation of variations of metamorphic mineral assemblages in a variety of rock compositions ensures that some measure of metamorphic grade is determined for most parts of the area. Where more than one rock association is present, the approach permits a more refined breakdown of metamorphic grade.

METAMORPHIC GRADE

For the purposes of this study, it is convenient to distinguish between *metamorphic zone*, a descriptive term for a mappable feature defined by mineral assemblages in one or more rock associations, and *metamorphic facies*, a particular range of temperature and pressure on a Pressure-Temperature (P-T) diagram. Metamorphic facies are defined by a combination of characteristic mineral assemblages in a number of rock compositions as determined by experimental data (Turner 1981; Spear 1993). Whereas metamorphic zones are concrete representations of variations in metamorphic grade, estimates of peak metamorphic P-T conditions are dependent, to varying degrees, on assumptions that can be difficult to validate, particularly in greenstone belts at low metamorphic grade.

In the "ragrd" column of Table 1, and also on Table 2, a series of two digit numbers represents increasing metamorphic grade ("grd") in each rock association ("ra"). The first digit indicates the rock association and the second digit indicates a relative increase in metamorphic grade. For example, the sequence 10 to 13 for metabasites corresponds to increasing grade from subgreenschist through greenschist, transition and amphibolite zones. Note that the mineralogical changes in quartzofeldspathic

Table 2: Diagnostic mineral assemblages (point data) are the basis for the definition of metamorphic grade in each metamorphic zone. Metamorphic zones on the map (Figure 2, back pocket) are derived from the grade in one or more rock associations. The first digit of the two-digit number in each cell indicates the rock association. The second digit indicates the relative metamorphic grade for the rock association (higher number, higher grade). The relative positions of the boundaries in rock associations 2 to 7 that correspond approximately to the lower/upper greenschist zone boundary on the map are inferred. The precise positions of these boundaries relative to each other have yet to be calibrated. Mineral name abbreviations: ab - albite, act - actinolite, am – amphibole undifferentiated, and - andalusite, bt - biotite, cb – carbonate (ankerite, calcite, dolomite, magnesite, siderite), cht - chlorite, crd - cordierite, ctd - chloritoid, cum - cummingtonite, diop - diopside, epg - epidote group, grt - garnet, gru - grunerite, hn - hornblende, kf - potassium-feldspar, mt - magnetite, plg - plagioclase, se - serpentine, sil - sillimanite, st - staurolite, tlc - talc, trm - tremolite, wm - white mica (muscovite, paragonite, talc).

Rock Association	Metamorphic Grade				
	Sub-greenschist Facies	Greenschist Facies			Amphibolite Facies
	Metamorphic Zones on Map				
	Sub-greenschist Zone	Lower Greenschist Zone	Upper Greenschist Zone	Transition Zone	Amphibolite Zone
	Diagnostic Mineral Assemblages				
1) Metabasites:metabasalt/gabbro/diabase, greenstone, amphibolite, meta-andesite	10 prn, prn-pu	11 act-cht-epg-ab		12 act-hn	13 hn-plg(calcic)
2) Metaquartzofeldspathic rocks: metarhyolite/dacite, qtz-fp metaporphyry, felsic metavolcaniclastite, metawacke	20 prn, prn-pu cht-wm	21 cht-wm cht-kf cht-wm-cb	22 bt epg-act	23 bt-hn	
3) Metamorphosed ultramafic rocks: metakomatiite, metaperidotite/dunite	30	31 cht-tlc-cb, se-cht cht-tlc-se-cb	32 clinoamphibole (trm, cum)		
4) Metamorphosed aluminum-rich rocks: metashale/siltstone, metahydrothermal alteration	40	41 cht-wm	42 bt, bt-grt, ctd-cht	43 crd-and/sil-bt st-and/sil-bt, crd orthoamphibole	
5) Chemical metasedimentary rocks, meta-iron formation	50 minesotaite greenalite	51 qtz-cht, cht-cb, mt-qtz	52 clinoamphibole (cum/gru), am-grt, two am		
6) Metamorphosed granitoids: metagranite to metatonalite	60 prn, prn-pu	61 cht-kf, cht-wm	62 bt, bt-epg, bt-epg-am		
7) Metamophosed carbonate-rich rocks: carbonate metasediments, meta-interpillow rock, metahydrothermal alteration, cht-cb schist	70	71 cht-cb-qtz cht-cb-wm-qtz	72 bt-cht-cb epg-cht-am-cb	73 diop-am-grt, hn-bt-qtz	
8) Unmetamorphosed granitoids: granite to tonalite	80 no metamorphic minerals				

(supracrustal and plutonic), aluminous and ultramafic rocks used to subdivide the greenschist zone on the map (Figure 2, in back pocket) do not occur in metabasites. The upper greenschist/amphibolite zone transition in quartzofeldspathic rocks (22 to 23) is not well calibrated, but observations in the more extensive higher grade rocks in the Red Lake greenstone belt (Thompson 2003) are consistent with this boundary. The transition can be mapped in intermediate metavolcaniclastic rocks and low-aluminum, possibly calcareous, metagreywackes. However, relatively few samples in the project area have attained the amphibolite zone (Figures 2 and 3).

ROCK ASSOCIATION DIAGNOSTIC METAMORPHIC MINERAL ASSEMBLAGES

This section follows closely the criteria described in previous studies of this kind (Thompson 2003, in press (2005)). Relict igneous clinopyroxene occurs sporadically in metabasite, metaultramafite, and alkalic metagranitoids (*see* Table 1). Relict igneous hornblende is rare in metavolcanic rocks, but does occur in metagranitoids. Small grains of detrital igneous or metamorphic amphibole and biotite were observed in several samples of subgreenschist grade Proterozoic metaclastites.

Metabasites (10 to 13)

Metamorphosed basalt, basaltic andesite, leucogabbro, gabbro, diabase and some lamprophyres are included in this rock association. Depending on their metamorphic mineral assemblages, in outcrop these rocks are greenstone (massive to weakly foliated), greenschist (intensely foliated), or amphibolites. Relatively rare, occurrences of pumpellyite with or without prehnite are attributed to the subgreenschist zone (10, Tables 1 and 2). The assemblage actinolite + epidote + chlorite + albite (11) is diagnostic of the greenschist zone in metabasites. Relatively aluminous rocks in this association have higher epidote and/or chlorite content at the expense of actinolite. Minor carbonate may also be present. Mafic rocks containing 5 to 10 modal percent carbonate are considered to be transitional to rock association 7 (Table 2). On the metamorphic map (Figure 2), subgreenschist and greenschist zone metabasites are represented by pale and medium green circles, respectively. With increasing grade, metamorphic hornblende appears. Rocks with both hornblende and actinolite and reduced amounts of chlorite and/or epidote are diagnostic of the transition zone in this rock association (12, Tables 1 and 2; yellow circles on Figure 2). Prograde chlorite and epidote are absent from the amphibolite zone where the characteristic assemblage is hornblende + calcic plagioclase (13, Tables 1 and 2; orange circles on Figure 2).

Metamorphosed Quartzofeldspathic Rocks (20 to 23)

This rock association consists of metamorphosed sandstone, conglomerate, quartz-feldspar porphyry, rhyolite, and felsic volcaniclastic rocks. Very low grade quartzofeldspathic metasedimentary rocks of Proterozoic age and a small number of Archean metaclastites that have distinctive textures (*see* "Metamorphic Zones") and/or that contain prehnite (with and without pumpellyite) are attributed to subgreenschist zone metamorphism (20, Tables 1 and 2). The appearance of biotite as a result of reaction between chlorite and potassic white mica and/or potassium feldspar is the key metamorphic boundary in these rocks. It separates chlorite + muscovite/potassium feldspar assemblages (21, Tables 1 and 2) from biotite-bearing rocks (22). The boundary is the basis for the new subdivision of the greenschist zone into lower and upper greenschist zones in the project area. Many samples of association 2 contain up to several modal percent carbonate at sub-biotite grade. As grade increases, first epidote and then hornblende occurs in some quartzofeldspathic rocks. First appearing some distance upgrade of the lower/upper greenschist zone boundary and typically associated with transition or amphibolite zone

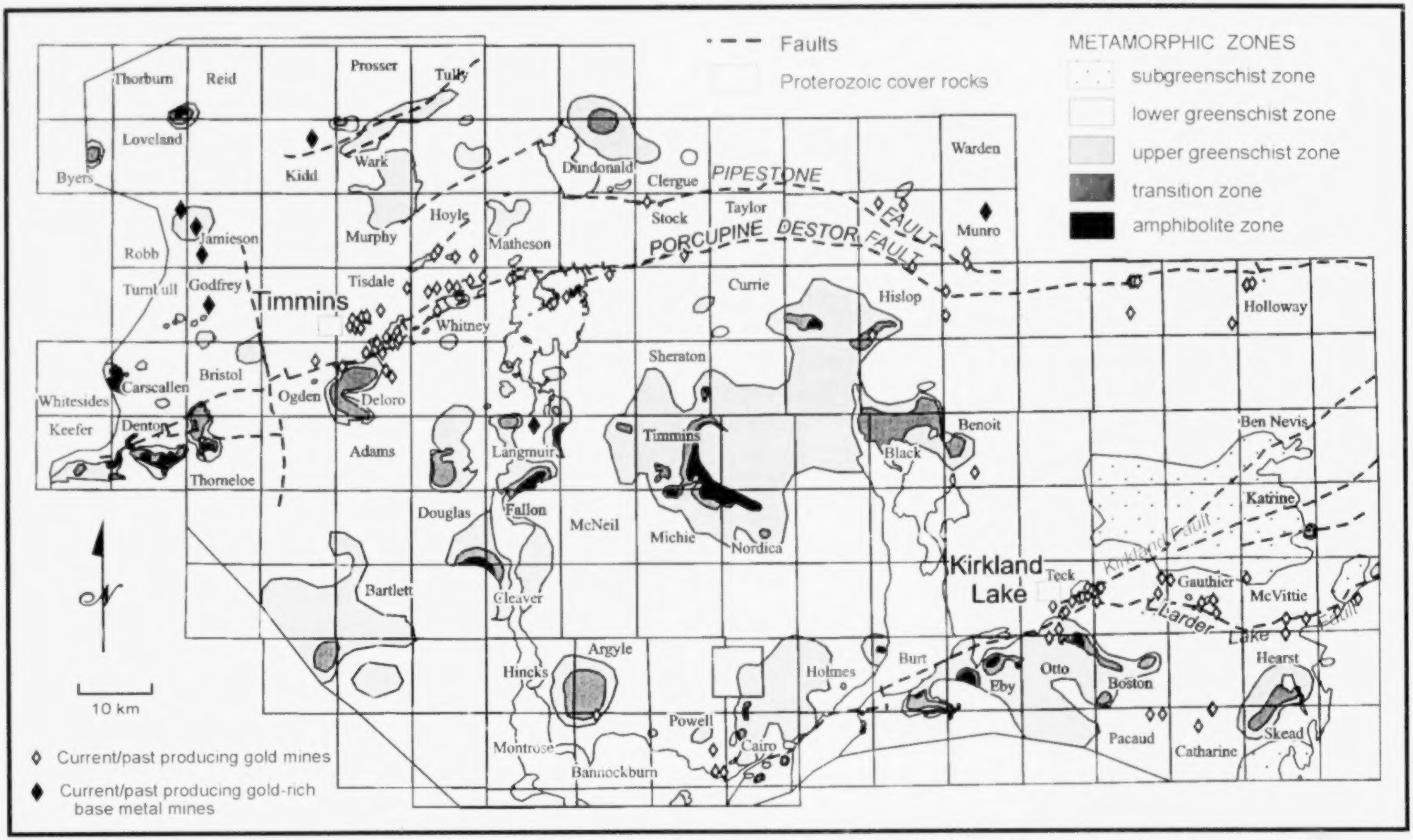

Figure 3. Simplified page-size version of Figure 2 (in back pocket), the metamorphic map of the Timmins–Kirkland Lake area. To improve clarity, the metamorphosed granitoids, the UTM grid, and gold occurrences have been omitted.

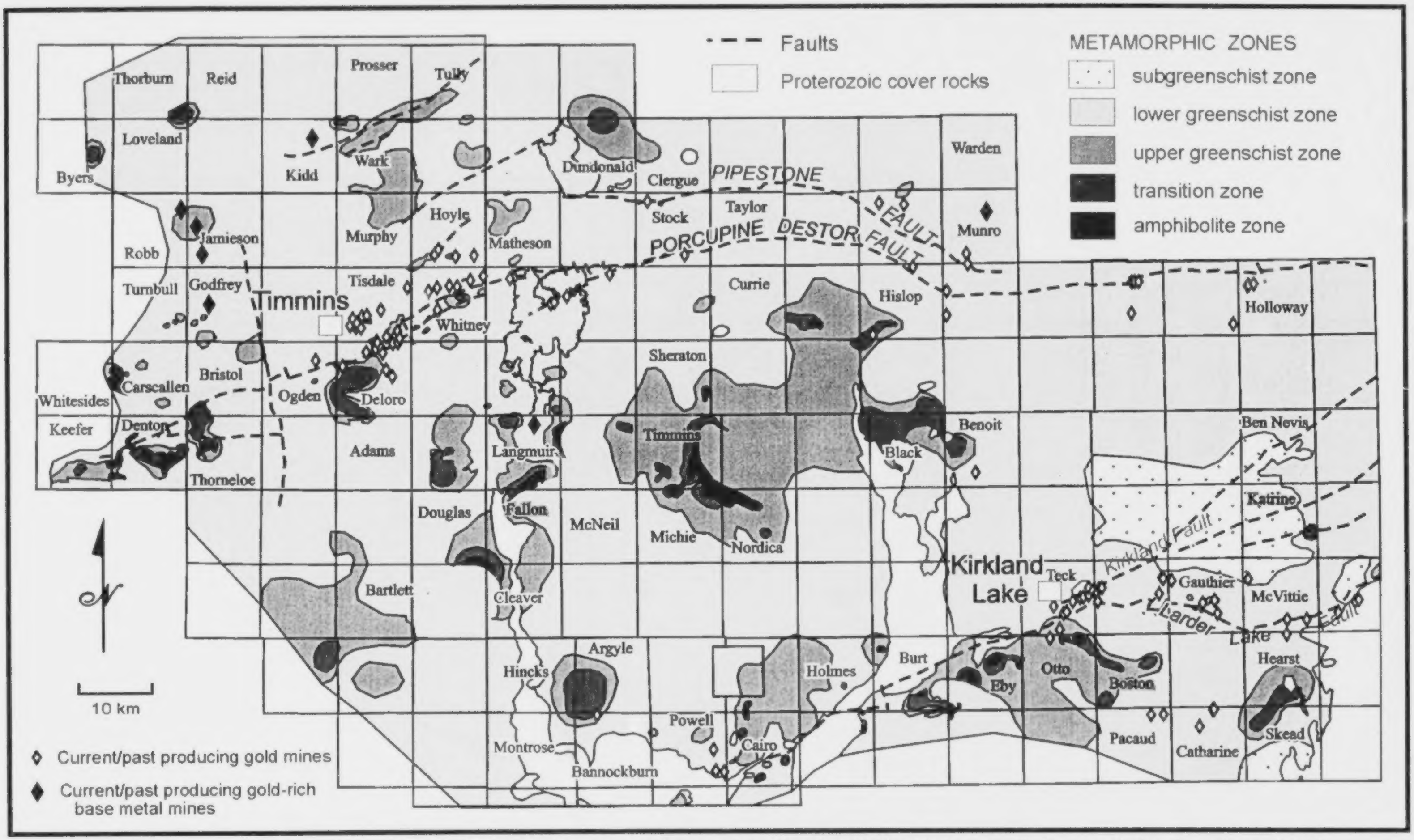

Figure 3. Simplified page-size version of Figure 2 (in back pocket), the metamorphic map of the Timmins–Kirkland Lake area. To improve clarity, the metamorphosed granitoids, the UTM grid, and gold occurrences have been omitted.

assemblages in metabasites, the appearance of hornblende in metaquartzofeldspathic rocks is attributed to amphibolite zone metamorphic grade (23, Tables 1 and 2). Both hornblende and, at lower grade, epidote may be products of reactions between carbonate, white mica and chlorite in these rocks. However, in many of the rock types included in association 2, mineral assemblages do not change with increasing metamorphic grade after the appearance of biotite and disappearance of chlorite in the greenschist zone. Increase in average grain size and obliteration of primary sedimentary, igneous and volcaniclastic textures are the only evidence of higher metamorphic grade. Increase in metamorphic grade from subgreenschist through lower and upper greenschist and into the amphibolite zone is represented by deeper shades of blue for the square symbols representing metamorphosed quartzofeldspathic rocks on the metamorphic map (Figure 2).

Metaultramafic Rocks (31 to 32)

More restricted in distribution, metamorphosed ultramafic igneous rocks (metakomatiite, metaperidotite) are clearly divided into low grade assemblages (31, Tables 1 and 2) made up of various combinations of talc, chlorite, carbonate and opaque minerals and higher grade assemblages (32) dominated by colourless clinoamphibole with or without one or more of the lower grade minerals. At the highest grades observed chlorite, talc and serpentine are absent. Pale violet (31) and medium violet (32) triangles represent these mineral assemblages on the metamorphic map (Figure 2). The distribution of petrographic data indicates that the appearance of amphibole in metamorphosed ultramafic rocks corresponds approximately with the appearance of biotite in metamorphosed quartzofeldspathic and aluminous rocks.

Metamorphosed Aluminum-Rich Rocks (40 to 42)

Classic muscovite-rich pelitic rocks are rare in the sample collection used for this study. Those that are interbedded with metasiltstone or metawacke are clearly metasedimentary rocks, but massive white-mica-rich rocks, some containing relict quartz or plagioclase phenocrysts, may be metamorphosed hydrothermally altered felsic rocks. The presence of tourmaline, chloritoid, or abundant sulphides is interpreted as further evidence of an altered pre-metamorphic protolith in this rock association (*see* "Alteration"). Lower greenschist zone mineral assemblages (41, Tables 1 and 2) containing chlorite and white mica (presumed to be muscovite) are much more common than biotite-bearing upper greenschist zone rocks (42) and subgreenschist zone (40) samples. Stars of variable shades of grey to black represent rock association 4 on the metamorphic map (Figure 2).

Metamorphosed Chemical Sedimentary Rocks/Iron Formation (50 to 53)

In rock association 5, low grade chlorite + carbonate + quartz + magnetite/sulphide rocks (51, Tables 1 and 2) can be separated from rocks that contain abundant clinoamphibole (52, Tables 1 and 2). One sample containing what looks like orthamphibole is assigned to the amphibolite zone (53). Medium and dark brown pentagons indicate the occurrence of amphibole-absent and amphibole-bearing metamorphosed iron formation on Figure 2.

Metagranitoid Rocks (60 to 62)

Metamorphosed plutonic rocks (granite to tonalite) are present in the study area. At lower grade (61, Tables 1 and 2), fine-grained aggregates of metamorphic chlorite and white mica and epidote replace igneous biotite, hornblende and calcic plagioclase. At higher grade (62), fine-grained aggregates of metamorphic biotite (with and without tiny beads of titanite) and epidote occur. The growth of needles and partial rims of amphibole (actinolitic to crossitic) on igneous hornblende and clinopyroxene in alkalic plutonic rocks is also interpreted to be a metamorphic process. Grain size reduction and other evidence of ductile deformation are typical of the granitoids inferred to be metamorphosed. Pale and dark pink diamonds represent lower and higher metamorphic grade, respectively, on the metamorphic map (see Figure 2). Secondary chlorite, white mica, epidote and amphibole, as well as deformation-related grain size reduction, could also be interpreted as products of deuteric processes late in the crystallization history of these rocks. However, map-scale variations in the petrographic data, concordance with metamorphic assemblages in adjacent metamorphosed supracrustal rocks, and the ages of the granitoids are all consistent with a metamorphic overprint.

Metamorphosed Carbonate-Rich Rocks (70 to 73)

Approximately 11% of the samples are sufficiently rich in carbonate or in the higher grade equivalent, calc-silicate minerals (amphibole, clinopyroxene), that they are included in this rock association. Four samples are interpreted to be subgreenschist zone (70). Most of the rocks, however, are made up of variable proportions of chlorite, carbonate, and plagioclase with or without white mica (71, Tables 1 and 2). Commonly these rocks are intensely foliated similar to the chlorite-carbonate schist and phyllite. In other examples, the rocks look like carbonate veins. At somewhat higher grade (72) in a few samples, biotite coexists with chlorite and carbonate. Diopside + amphibole assemblages represent the highest grades observed (73). Crosses in shades of yellow-green represent these samples on the metamorphic map (Figure 2). Working with a single thin section, it is not always possible to determine if the protolith is metamorphosed carbonate alteration of metabasalt/gabbro, interpillow material, carbonate veins or carbonate-rich clastic metasedimentary rocks.

Unmetamorphosed Granitoid Rocks (80)

Two unmetamorphosed samples occur in the Watabeag granitoid complex in the central part of the project area (Figure 2). Biotite, hornblende and plagioclase in these rocks are essentially unaltered and igneous textures are prominent due to a lack of deformation and recrystallization. If the preferred working hypothesis that most of the plutonic rocks in the area predate the main metamorphic event is correct, these samples can be explained in one of two ways. It is possible that metamorphic fluids and deformation did not penetrate into those parts of the pluton represented by these samples or that the samples are from a previously unmapped component of the complex that is younger than the main metamorphism.

DEFORMATION

A qualitative estimate of the intensity of strain was made for many samples (DEFM column, Table 1) by noting whether the rock is massive (msv) or if it contains a weak (w), moderate (m) or intense (i) preferred orientation (po) of individual mineral grains and/or mineral aggregates. Evidence of ductile deformation in the form of polygonized grains, grain size reduction, mortar texture, crenulation of the main fabric, and folding/polygonization of veins is also noted. Mortar texture refers to grain size reduction/polygonization around the margins of quartz and feldspar in relatively coarse-grained rocks such as metagranitoids. Working with single thin sections only, the degree to which a preferred orientation is a linear or a planar fabric is difficult to assess. This subset of the petrographic data set is a basis for investigation of the regional variations in deformation intensity and potential relationships between deformation, hydrothermal alteration, metamorphic grade and gold mineralization.

ALTERATION

In the course of reconnaissance petrography, qualitative observations of the type, intensity and timing of alteration were recorded when textures and mineralogy warranted the attempt. In the ALT column of Table 1, weak (w), moderate (m), and intense (i) are applied to carbonate (cb) and white mica (wm) alteration (alt). Where the letter indicating intensity is absent, there is some uncertainty about that aspect. The presence of unusual amounts of tourmaline (to) or chloritoid (ctd) is assumed to be an indication of some degree of hydrothermal alteration. In almost all cases, textures are consistent with alteration prior to or during metamorphism and ductile deformation of the rock. Although qualitative, these data will be the basis for an investigation of regional variations in these parameters and their relationships, if any, with metamorphic grade, intensity of deformation, and past and present gold mines.

Metamorphic Map

The new map of Archean metamorphism in the Timmins–Kirkland Lake area (*see* Figures 2 and 3) is consistent with Jolly's (1978) coverage of the entire Abitibi greenstone belt in that the greenschist zone is predominant with only small patches of amphibolite zone rocks present. The current study enhances Jolly's major contribution by subdividing the greenschist zone and adding data in several key areas. The variable distribution of point data symbols on Figure 2 (in back pocket), indicates the presence of gaps in data set. Coverage is particularly thin in parts of the area between the Destor–Porcupine and Cadillac–Larder Lake fault zones, along the easternmost segment of the Porcupine–Destor Fault, and northwest of Timmins. Part of the data gap southeast of Kirkland Lake on the current map is covered quite well by Jolly's (1974) more detailed study. In spite of these limitations, the updated metamorphic zones presented here represent an important step toward a better understanding of the metamorphic framework in this segment of the Abitibi greenstone belt.

METAMORPHIC ZONES

Metamorphic zone boundaries are based for the most part on mineral assemblages in metabasites, metamorphosed quartzofeldspathic rocks and metaultramafites. In some areas, metamorphosed aluminous rocks (rock association 4) and metagranitoids (rock association 6) provide key constraints on the metamorphic zonation. Making up 11% of the samples, rock association 7 (metamorphosed carbonate-rich rocks) is less definitive with respect to metamorphic grade because, given the appropriate fluid compositions, the "low" grade assemblages (71, Tables 1 and 2) can coexist with transition zone and amphibolite grade rocks (*see* "Origin of Metamorphic Anomalies and Related Gold Deposit Types"). At localities where more than one sample is present, the symbol representing the lowest sample number may obscure underlying symbols. On the digital version of the map (MRD 155), clicking on the uppermost symbol at a given locality reveals the complete data set.

Amphibolite Zone

Characterized for the most part by the assemblage hornblende + calcic plagioclase in metabasites (Tables 1 and 2), most of the highest grade rocks in the project area are limited to small patches and narrow elongate zones immediately adjacent to metagranitoid rocks of both the felsic-intermediate suite and alkalic suite (Figures 2 and 3). The amphibolite zone rim on the 1.5 km wide mass of metabasite in the alkalic Otto stock (Otto Township, southeast) is less than 350 m wide. In Keefer Township (west), most of a narrow v-shaped mass of metabasite that is surrounded by granitoid rocks is in the greenschist zone. Evidently the high grade metamorphic conditions did not extend very far into the rock units surrounding the intrusions. In Thorburn (northwest) and Eby (southeast) townships, small areas of amphibolite zone are separated from the nearest pluton by more than a kilometre of lower grade rocks (Figures 2 and 3). Narrow zones of amphibolite grade trend away from the granitoid contact in Carscallen and Denton townships (west). These examples raise the possibility that the amphibolite zone is not necessarily related to the nearest large mass of granitoid.

Transition Zone

Defined on the basis of two-amphibole-bearing mineral assemblages in metabasites (Table 2), the transition zone occurs as kilometre-scale, isolated patches and as narrow zones up to a few hundred metres wide that are associated with occurrences of amphibolite zone (Figures 2 and 3). In some cases, the zone is inferred on the basis of documented greenschist and amphibolite zone rocks on either side. Many occurrences are closely associated with felsic-intermediate or alkalic metagranitoids, but the spatial relationship is less well defined than it is for amphibolite zone rocks. Several of the isolated areas of transition zone rocks are located 5 to 10 km or more away from the nearest felsic-intermediate or alkalic metagranitoid. In contrast to the amphibolite zone, a number of transition zone assemblages are associated closely with the metafelsite-porphyry intrusive suite (e.g., in Deloro and Whitney townships in the west, and Katrine, Hearst and Skead in the east. Furthermore, Jolly (1974) records hornblende adjacent to small metafelsic intrusions in McVittie Township in an area where no thin sections were available for this study. Transition zone mineral assemblages also occur adjacent to the enigmatic Prosser pluton (Prosser Township, northwest) and in the middle of the supracrustal package 6 km to the southeast. In Nordica Township (central), the transition zone sample occurs in the middle of a pluton of the felsic-intermediate metagranitoid suite. It is not clear if this indicates transition zone-grade metamorphism of adjacent granitoid or if the transition assemblage is a contact metamorphic effect of the pluton on an inclusion.

Upper Greenschist Zone

The upper greenschist zone is defined by the presence of biotite in metamorphosed quartzofeldspathic and aluminous rocks and amphibole in metamorphosed ultramafic rocks (Table 2). Metagranitoids (metagranite-metatonalite) containing biotite that, on textural grounds, is assumed to be metamorphic are included in the upper greenschist zone. Alkalic metagranitoids containing metamorphic amphibole in the presence of igneous biotite that is apparently stable are also included in the zone. Textural evidence of metamorphism includes fine-grained aggregates of biotite that have replaced a pre-existing igneous biotite grain or a chlorite pseudomorph after igneous biotite and microscopic products of ductile deformation in the form of a preferred orientation or mortar texture (polygonized zones rimming relatively coarse igneous feldspar). The fact that the upper/lower greenschist zone boundary can be mapped across plutons in a number of places in the west (Denton Township), central (Michie and Nordica townships), and east

(Otto and Pacaud townships) parts of the map supports the working hypothesis that the textural features are the products of a regional metamorphic event rather than syn-intrusion deuteric processes.

While still associated, locally, with felsic-intermediate and alkalic metagranitoids, the number of upper greenschist zone areas that are separated from granitoids by tens of kilometres of lower grade rocks is much higher than for transition zone occurrences (Figure 2). As noted above, upper greenschist zone metamorphism has transformed significant parts of these metaplutonic suites. Upper greenschist zone occurrences range in size from a few hundred metres to tens of kilometres across. In the northwest, there appears to be a spatial relationship between this grade of metamorphism and major fault systems.

Lower Greenschist Zone

Characterized by the presence of chlorite and white mica/potassium feldspar in rock associations 2 and 4, chlorite + white mica + epidote after igneous biotite in metagranitoids, and the absence of amphibole from metamorphosed ultramafic rocks (Tables 1 and 2), the lower greenschist zone is the most extensive on the metamorphic map (Figures 2 and 3). Although further petrographic work within the larger areas that contain little or no data will likely reduce the extent of the zone with respect to subgreenschist and upper greenstone zones, the predominance of the zone is not expected to change. A striking feature of the new metamorphic map is the widespread distribution of lower greenschist zone assemblages across the domain between the Destor–Porcupine and Cadillac–Larder Lake fault systems that is dominated by granitoid rocks. Furthermore, the widespread evidence that the granitoids are modified to a varying degree by low grade metamorphism is also important with respect to the reconstruction of the geological setting of gold deposits in the Timmins–Kirkland Lake area (*see* "Metamorphic Constraints on Geological Setting of Gold Deposits").

There are eight localities (Keefer, Thorburn, Wark, Sheraton, Nordica, Timmins and Eby townships, Figure 2) where lower greenschist zone samples occur within areas of higher metamorphic grade rocks. These features are assumed to form after the maximum metamorphic conditions peaked as the rocks cooled during exhumation to the surface (*see* "Origins of Metamorphic Anomalies and Related Gold Deposit Types").

Subgreenschist Zone

Located for the most part in the southeast quadrant of the map area (Figures 2 and 3), the lowest grade metamorphic zone is the most difficult to confirm petrographically because micaceous minerals are very fine-grained, some rock associations do not contain diagnostic minerals at this grade and those that do are not widely distributed. Occurrences of pumpellyite and/or prehnite are sporadic. Given the reconnaissance nature of the petrography completed for this project and the low sample density northwest of the Kirkland Lake fault, attribution of samples to the subgreenschist grade is often a judgment call based on textures and a comparison with more common greenschist zone rocks. These difficulties may explain why the largest area of subgreenschist zone does not extend another 20 km north and northwest as indicated by Jolly (1978). The distribution of the zone south and east of Kirkland Lake (Figures 2 and 3) is consistent with the more detailed work by Jolly (1974) and the small patch near the south limit (Bannockburn and Montrose townships) with Powell et al. (1993). More data is required to determine if the isolated occurrences of subgreenschist zone rocks in the north-central part of the map (Clerque, Dundonald and Currie townships, Figures 2 and 3) are diabase dikes that post date Archean metamorphism but have been affected by a Proterozoic event. Mineral assemblages and textures in a small number of samples from the Proterozoic cover sequence (symbols only on Figure 2) are consistent with the Proterozoic subgreenschist facies metamorphic event indicated by Easton (2000) and Easton and

Berman (2004) on their metamorphic compilation maps for the Canadian Shield in Ontario. Clear evidence of this event was not observed, however, in Archean rocks.

METAMORPHIC GRADE AND GOLD MINERALIZATION

The irregular pattern of metamorphic grade is a distinctive feature of the Timmins–Kirkland Lake area (Figures 2 and 3). At map scale, there is neither the simple linear zonation typical of regional metamorphic terranes nor the straightforward relationship between higher metamorphic grade and intrusive granitoid rocks that occurs if contact metamorphism is the dominant process. The complexity likely reflects the composite nature of the metamorphic pattern. That is, at the present erosion level, relatively small zones of higher metamorphic grade formed at different times by more than one process within a regional thermal regime characterized by lower greenschist facies metamorphic conditions. Sometime after the map-scale metamorphic zones formed under peak metamorphic temperatures and pressures and after uplift and cooling had begun, small-scale, relatively low grade zones overprinted lower greenschist to amphibolite zone rocks as they were being exhumed toward the earth's surface. For the purposes of this paper, it is convenient to refer to kilometre-scale zones of higher grade surrounded by low metamorphic grade and low grade zones surrounded by higher metamorphic grade as metamorphic anomalies, or metamorphic "hot" and "cold" spots, respectively. Metamorphic anomalies merit further attention here because, as is the case in the Red Lake greenstone belt in northwest Ontario (Thompson 2003), there is a spatial relationship between metamorphic zone boundaries and past- and present-producing gold mines (Figures 2 and 3).

Whereas gold occurrences are widely distributed across the supracrustal packages in the Timmins–Kirkland Lake map area, gold mines are concentrated in the vicinity of major fault systems (Figure 2). Whether this pattern represents the true distribution of all large gold deposits or just a reflection of the exploration models that have applied remains to be proven. Metamorphic zones may be of assistance in this regard because the relationship between metamorphic grade and gold mineralization is not random.

Amphibolite and Transition Zones

In the amphibolite zone there are no gold mines and only two gold occurrences (Figure 2, Eby Township, southeast). Past producers Golden Arrow West (Hislop Township, central east) and Ashley (Bannockburn Township, south-central) are the only mines in the transition zone, but gold occurrences are quite common in 10 townships (Figure 2) ranging from west (Denton Township) to east (Hearst Township) and north (Dundonald Township) to south (Argyle Township). It is noteworthy that both of these past producing gold mines occur in the lower grade portion of the transition zone close to the boundary with the upper greenschist zone.

Upper and Lower Greenschist Zones

Predictably, given the wide distribution of gold mineralization, the majority of past and present gold mines and gold occurrences are located in the most extensive metamorphic zones (Figure 2). Once again, however, the pattern is not random with many of the richest gold mines discovered to date concentrated close to major fault systems. Of the 10 past and present gold producers at some distance from major fault systems, one occurs in the upper greenschist zone in Deloro Township (McLaren–Porcupine Mine) and three in the lower greenschist zone of Benoit (Davidor–Bourkes Mine) and Catharine (Golden Shield and Cathroy mines) townships. Seven others identified as gold-rich volcanic associated massive sulphide deposits (Godrey, Jamieson, Kidd, Langmuir and Munro townships) (*see* Figure 3) will not be discussed here because these deposits are at least 30 million years older than the metamorphic events documented in this study, and any spatial relationship with metamorphic grade is fortuitous. Mapping of the unusual metamorphic mineral assemblages formed from the pre-metamorphic alteration associated with these deposits can assist exploration (*see* "Origin of Metamorphic Anomalies and Related Gold Deposit Types"), but they occur at all metamorphic grades. The focus of this part of the report is on gold deposits that could have formed during metamorphism.

There is a striking tendency for gold mines located near major fault systems in the lower greenschist zone to occur within or close to upper greenschist grade metamorphic anomalies (Figures 2 and 3). Three metamorphic "hot" spots immediately east of Timmins are a good example of this relationship. The Dome mine is located at the southwest end of one, kilometre-scale, upper greenschist zone anomaly. The Paymaster, Fuller and Ankerite deposits rim another anomaly a few hundred metres to the southwest. Further southwest in Deloro Township, the Faymar and McLaren–Porcupine past producers bracket the lower/upper greenschist zone boundary associated with a large U-shaped anomaly that has a core of transition zone. The Naybob Mine is located close to the boundary on the northwest side of the anomaly. Northeast of Timmins, the Bell Creek–Hoyle Pond Mine trend is associated with two elongate upper greenschist zone anomalies. An anomaly several hundred metres long (based on one sample in a cluster of 25 samples) occurs between the Pamour and Hoyle mines. Whether or not the relationship continues along this trend toward the southwest is obscured by the absence of petrographic data. Petrographic data density is generally much lower east of Kirkland Lake, but, in Gauthier Township, the Upper Canada and Eastward gold deposits are associated with upper greenschist zone anomalies (Figure 2). Taken together, the apparent correlation between upper greenschist zone anomalies and past and present gold mines suggests that metamorphic data provide a way of determining which segments of major fault systems have the highest potential for large gold deposits.

Detailed analysis of the distribution of the hundreds of gold occurrences within the lower and upper greenstone zones is beyond the scope of this report. In the northwest corner of Stock Township (Figure 2), however, the Clavos Mine and a gold occurrence about 3 km to the east coincide with small upper greenschist zone anomalies proximal to the Pipestone Fault. Given the spatial relationship between gold mines and upper greenschist zone anomalies elsewhere in the map area, these occurrences have a higher potential for association with significant gold deposits than others within the lower greenschist zone.

Subgreenschist Zone

Although gold occurrences are quite common in the subgreenschist zone (Figure 2), the density is much lower than that in the lower greenschist zone. One past producing gold mine is located near the boundary with the latter in Gauthier Township. Note that the position of the boundary there is not tightly constrained. The subgreenschist zone anomaly associated with gold deposits in the northeast corner of Teck Township is based on a single sample.

Origins of Metamorphic Anomalies and Related Gold Deposit Types

The spatial relationship between gold mines and the irregular metamorphic zonation in the Timmins–Kirkland Lake area occurs in the Yellowknife (Thompson, in press (2005)) and Red Lake (Thompson 2003) greenstone belts in the Northwest Territories and Ontario, respectively, and in the Kalgoorlie region of Western Australia (Hall 1998, based on petrography by Mikucki and Roberts 2004). I have interpreted the relationship to mean that belt-scale metamorphic zone boundaries and kilometre-scale metamorphic anomalies mark zones where a combination of factors created an environment through which the flow of hydrous fluids is sufficient to form a gold deposit. Different combinations of fluid source, timing, temperature, pressure, magmatism, deformation and metamorphism will produce different types of gold deposit. Analysis of the possible origins of the metamorphic pattern, therefore, will assist in the development of future exploration models.

REGIONAL VERSUS CONTACT METAMORPHISM

The abundant granitoids that are characteristic of low pressure metamorphic terranes have long been viewed as the most likely source of heat for the metamorphism. A closer look, however, reveals that a significant proportion of these rocks are either too old (basement to the supracrustal rocks or synvolcanic in age) or too young (intruded into already metamorphosed country rocks) to be the main source of metamorphic heat. For low pressure terranes in general (Thompson 1989a, 1989b) and for the Yellowknife (Thompson, in press (2005)) and Red Lake (Thompson 2003) greenstone belts in particular, I have proposed that heat required to produce both low pressure regional metamorphism and abundant syn-orogenic granitoids is in part inherited from the thinning of the lithosphere associated with supracrustal basin formation and in part derived from radiogenic heat production in the tectonically overthickened crust that forms during orogenesis. The preferred metamorphic history of the Yellowknife and Red Lake greenstone belts involves a long duration regional metamorphism (tens of millions of years) punctuated by short duration contact metamorphic events (hundreds of thousands of years) related to intrusion of individual plutons. A variation of this theme is the preferred explanation for the metamorphic pattern in the Timmins–Kirkland Lake area.

The close spatial relationship between the amphibolite zone and both felsic-intermediate and alkalic metagranitoids is consistent with a contact metamorphism origin for these high grade rocks. The fact that none of these zones can be shown to be continuous around a pluton or batholith, as indicated on Jolly's (1978) compilation, may be due mainly to a lack of data. There are, however, a number of localities where lower and upper greenschist zone rocks occur close to these granitoids implying a very narrow or absent amphibolite zone. This situation occurs, for example, in the western (Keefer, Carscallen, Turnbull townships), central (Langmuir, McNeil townships), and eastern (Benoit, Pacaud townships) parts of the project area. Elsewhere, transition zone rocks occur adjacent to the typically much smaller bodies of the metafelsite-metaporphyry suite, also without evidence of amphibolite grade metamorphism (Deloro, Whitney, Katrine townships). The narrow width of the higher grade zones implies intrusion into relatively cool rocks and the steep temperature gradient that would occur in such a situation. As the age of this suite overlaps with felsic volcanism (*see* "Metamorphic Constraints on Geological Setting of Gold Deposits"), it is probable that the porphyritic units intruded relatively close to the earth's surface where the country rocks were at temperatures less than 100°C. Considering that the ages of the felsic-intermediate suite also overlap with Porcupine assemblage felsic volcanic rocks (Ayer et al. 2003), these granitoids may be the coarser-grained equivalents of the porphyry suite and may have intruded at somewhat deeper but still relatively shallow, cooler levels in crust. The onset of alkalic magmatism occurred 5 to 7 million years after the Porcupine felsic volcanism and the main phase of porphyry intrusion ended. One of two igneous ages obtained from the Timiskaming volcanosedimentary assemblage falls in the middle of the age range for alkalic intrusions and the other is somewhat younger than the alkalic rocks. That is, the amphibolite and transition zone contact metamorphic aureoles developed at various times before and during deposition of the Timiskaming assemblage.

Petrographic evidence (Figures 2 and 3; Table 1) indicates that Timiskaming and older supracrustal assemblages and all three granitoid suites were subjected to lower greenschist and, to a lesser extent, greenschist zone metamorphism and ductile deformation. The regional scale of this event and its concordance with belt-scale metamorphic zones of lower and higher grade (Jolly 1978; Easton and Berman 2004) to the east and west are the basis for considering it to be a regional metamorphic event. Like the Yellowknife and Red Lake greenstone belts, the metamorphic pattern in the Timmins–Kirkland Lake area is a composite effect of contact and regional metamorphic events. Unlike the other two, this part of the Abitibi greenstone belt is dominated by lower greenschist zone metamorphic grade and the contact events may be pre- rather than syn-orogenic (*see* "Metamorphic Constraints on Geological Setting of Gold Deposits"). Having established a working hypothesis that explains the origin of the metamorphic pattern, the question as to why there is a spatial relationship between gold mines and metamorphic "hot" spots can be addressed.

METAMORPHIC ZONE BOUNDARIES AND FLUID PRODUCTION

The changes in mineral assemblage that occur across metamorphic zone boundaries can be represented as dehydration and decarbonation reactions that, in most cases, produce significant volumes of fluid (Spear 1993; Bucher and Frey 1994). As anomalous volumes of fluid are required to produce gold deposits, perhaps the reason gold deposits occur in the vicinity of metamorphic zone boundaries is because metamorphic fluid flow is concentrated near these features.

Unpublished model calculations indicate that at least some fluid-producing metamorphic reactions are associated with a negative change in the volume of solid phases as generally higher density, less hydrated and/or carbonated minerals grow at the expense of chlorite, white mica, carbonate, serpentine, and quartz. If fluid pressure equals lithostatic pressure near a metamorphic zone boundary (Figure 4), it is possible that the combination of high fluid production and negative volume change of the solids produces a more porous, relatively permeable zone that focuses and enhances fluid flow. If this idea is valid, a combination of gold-bearing metamorphic fluids and a physical or chemical trap could produce a synmetamorphic gold deposit near a metamorphic zone boundary.

Of particular interest in this regard would be anomalous environments where metamorphic zone boundaries are closely spaced or where they intersect a structural conduit in a manner that focuses the flow of heat and fluids or where a boundary intersects a rock unit that is particularly effective at precipitating gold from hydrous fluids.

METAMORPHIC "HOT" AND "COLD" SPOTS

Metamorphic anomalies may reflect anomalously high temperatures, high proportions of carbon dioxide in the fluid passing through the rock, unusual rock compositions, or some combination of these factors. For example, higher metamorphic grade does not necessarily mean higher metamorphic temperatures if hydrous fluids are rich in carbon dioxide and a dramatic change in the metamorphic mineralogy of a particular rock unit may reflect the outer limit of a pre-metamorphic alteration zone rather than an increase in metamorphic temperature. Figure 5 is a schematic representation of several possible origins for metamorphic anomalies and the types of gold deposit that may be associated with these features.

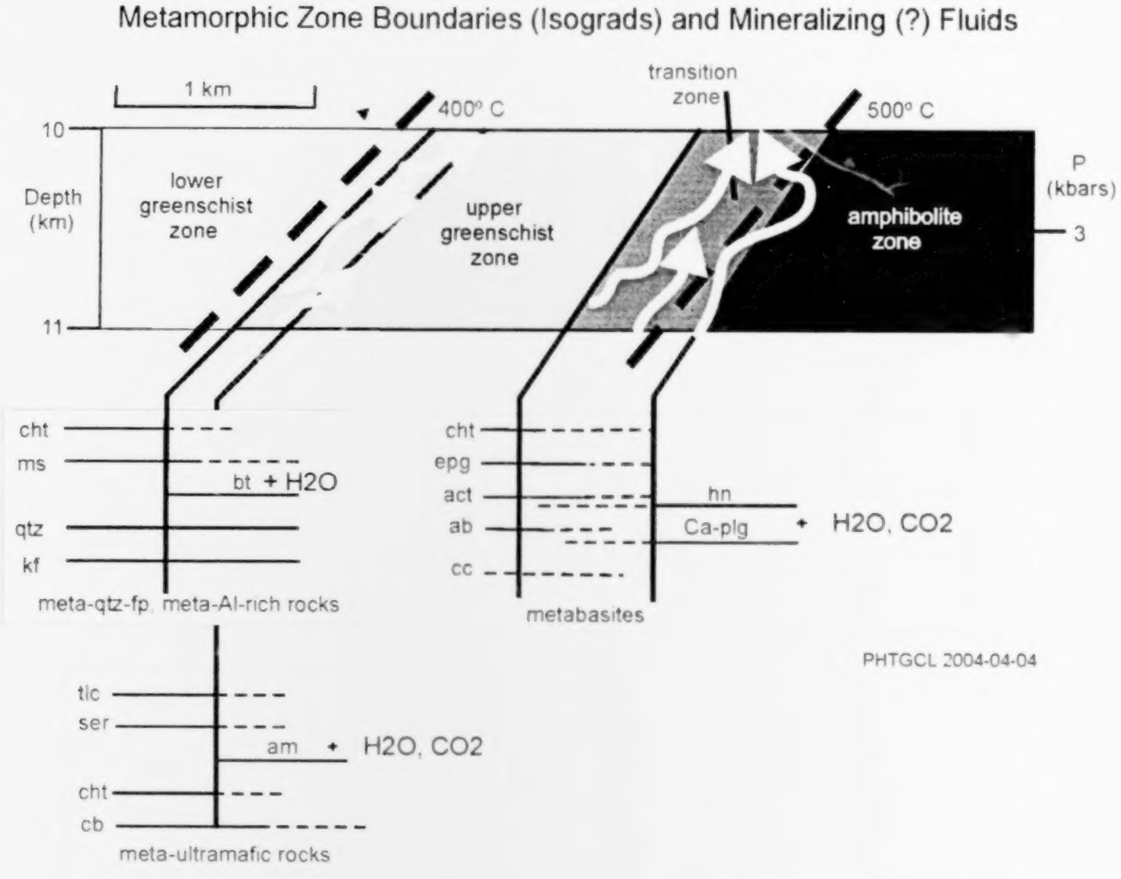

Figure 4. Schematic reconstruction of fluid flow regime in vicinity of metamorphic zone boundaries. (See legend for Table 1 (Appendix 2) for explanation of abbreviations.)

Pre-metamorphic Hydrothermal Alteration Zones

During the volcanism and sedimentation that formed the supracrustal components of the Abitibi greenstone belt, there was ample opportunity for hydrothermal alteration, a process that has the potential to change significantly the composition of some rock units. In contrast, except for gain and/or loss of water and carbon dioxide, both regional and contact metamorphism are essentially isochemical processes. Therefore, during metamorphism, the unusual compositions produced by hydrothermal alteration are likely to be characterized by mineral assemblages that contrast sharply with those that develop in adjacent unaltered rocks. In this case, mineral assemblages change even though metamorphic conditions and hence the metamorphic grade remains constant. As metamorphic grade increases with time the mineralogy of the metamorphosed alteration will change but remain distinct from the unaltered rocks. On Figure 5, the checker board pattern represents mineralogical changes within both the upper greenschist and transition zones that reflects compositional changes related to pre-metamorphic hydrothermal alteration rather than variable metamorphic grade. This kind of metamorphic anomaly would be associated with a gold-rich

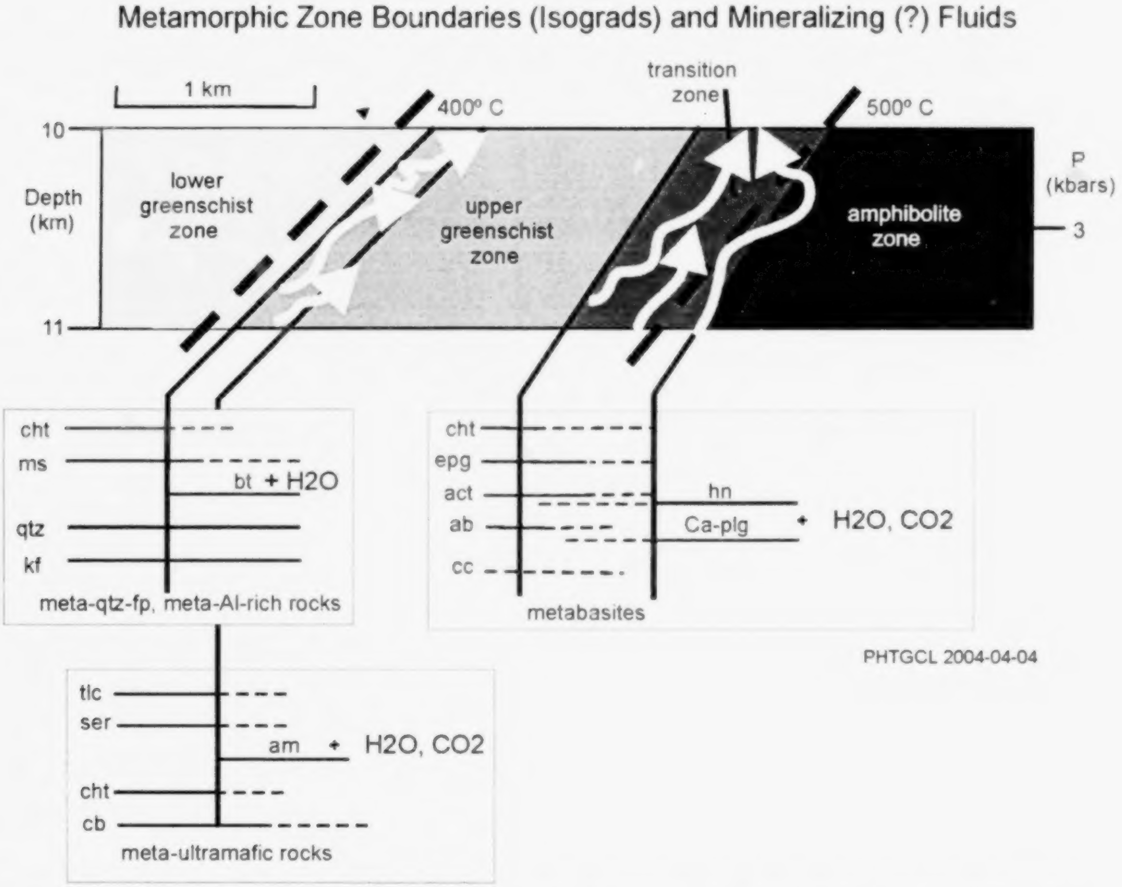

Figure 4. Schematic reconstruction of fluid flow regime in vicinity of metamorphic zone boundaries. (See legend for Table 1 (Appendix 2) for explanation of abbreviations.)

Pre-metamorphic Hydrothermal Alteration Zones

During the volcanism and sedimentation that formed the supracrustal components of the Abitibi greenstone belt, there was ample opportunity for hydrothermal alteration, a process that has the potential to change significantly the composition of some rock units. In contrast, except for gain and/or loss of water and carbon dioxide, both regional and contact metamorphism are essentially isochemical processes. Therefore, during metamorphism, the unusual compositions produced by hydrothermal alteration are likely to be characterized by mineral assemblages that contrast sharply with those that develop in adjacent unaltered rocks. In this case, mineral assemblages change even though metamorphic conditions and hence the metamorphic grade remains constant. As metamorphic grade increases with time the mineralogy of the metamorphosed alteration will change but remain distinct from the unaltered rocks. On Figure 5, the checker board pattern represents mineralogical changes within both the upper greenschist and transition zones that reflects compositional changes related to pre-metamorphic hydrothermal alteration rather than variable metamorphic grade. This kind of metamorphic anomaly would be associated with a gold-rich

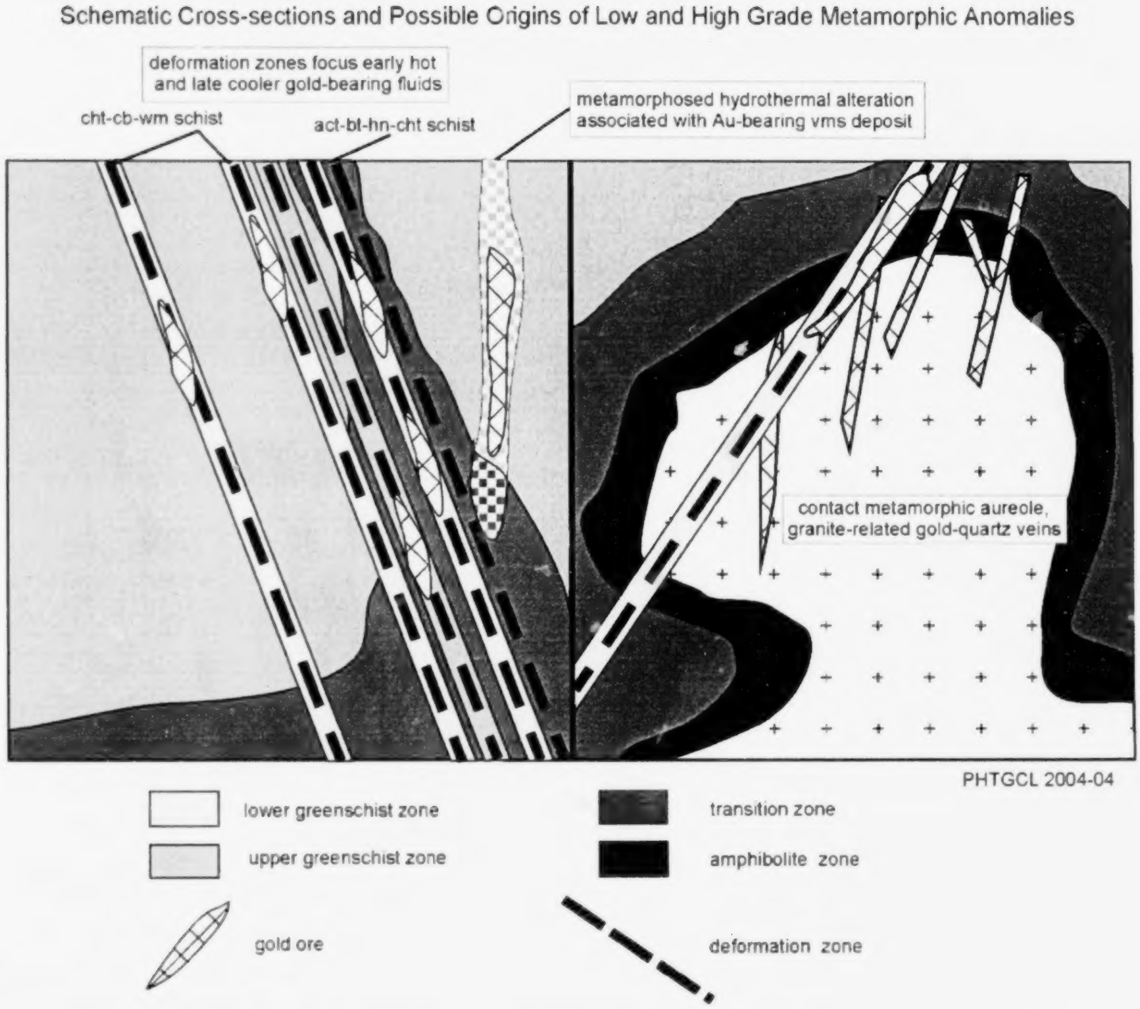
Schematic Cross-sections and Possible Origins of Low and High Grade Metamorphic Anomalies
deformation zones focus early hot and late cooler gold-bearing fluids
cht-cb-wm schist
act-bt-hn-cht schist
metamorphosed hydrothermal alteration associated with Au-bearing vms deposit
contact metamorphic aureole, granite-related gold-quartz veins
PHTGCL 2004-04
lower greenschist zone
upper greenschist zone
gold ore
transition zone
amphibolite zone
deformation zone

Figure 5. Schematic representation of possible origins for high and low grade metamorphic anomalies. (See legend for Table 1 (Appendix 2) for explanation of abbreviations.)

volcanic-associated massive sulphide deposit like Kidd Creek (northeast Kidd Township, Figures 2 and 3). Schandl and Wicks (1993) describe metamorphosed hydrothermal alteration on a property just north of the Kidd Creek Mine. Chloritoid-rich aluminous and quartzofeldspathic metaclastic rocks (e.g., samples AE08905, AG04698 and AI05932, Table 1, Appendix 2) in the southwest corner of Prosser Township (Figure 2) are good candidates for metamorphosed pre-metamorphic hydrothermally altered rocks.

Buried Plutons

Some upper greenschist and transition zone metamorphic anomalies in the project area may be related to contact metamorphism caused by a buried pluton (*see* Figure 5). Plutons are a possible source of heat, fluids and metals. In this case, granitoid- or porphyry-related gold mineralization would be the target.

Lithostructural Conduits

At different times during their history, deformation zones could focus and enhance fluid flow upward through the crust (*see* Figure 5). Close to the time of peak metamorphic conditions, fluids from depth would be hotter than rocks surrounding the conduit located near to the earth's surface, thus producing relatively high grade metamorphic rocks in the deformation zone. Later, after the regional metamorphic pattern has been established and exhumation (uplift and erosion) is moving metamorphic rocks closer to the surface, upper greenschist zone rocks could be retrograded to form lower greenschist zone "cold" zones by fluids that have cooled to a significant degree before they come in contact with the upper greenschist zone rocks. Both these scenarios are geological environments in which classic Archean "shear zone-hosted" lode gold deposits should be targeted.

Another kind of lithostructural conduit is formed where plutons that intruded before orogenesis began (synvolcanic) or that intruded early in the crustal thickening phase act as relatively competent buttresses during the main phase of ductile deformation. Such bodies could deform in brittle rather than a ductile fashion, thereby developing an anomalous porosity and permeability that could focus and enhance fluid flow enough to produce a relatively high grade metamorphic anomaly. This scenario was proposed as an explanation for the correspondence of metamorphic "hot" spots and gold mines close to the McKenzie and Dome Stocks in the Red Lake greenstone belt (Thompson 2003). It is possible that one or more of the amphibolite zone anomalies associated with metagranitoid bodies in the central part of the Timmins–Kirkland Lake area (Figures 2 and 3) formed in this way.

Higher/Lower Temperatures or Higher CO_2 Fluid Content

Dehydration reactions such as those that produce biotite in aluminous and quartzofeldspathic metamorphic rocks will proceed at lower than normal temperatures if the coexisting fluid is a mixture of water and carbon dioxide (Spear 1993). Similarly, prograde mineral reactions that produce amphibole at the expense of carbonate and quartz and chlorite or talc can be reversed at constant temperature and pressure if coexisting fluid composition becomes richer in CO_2. In this case, what appears to be a "retrograde" chlorite-carbonate shear zone cutting across a transition zone greenstone may actually have formed when the rocks were still at transition zone grade because a CO_2-rich fluid moved along the deformation zone. That is, both metamorphic "hot" and "cold" spots may in fact have formed at ambient metamorphic temperatures in response to the influx of CO_2-rich fluids. In both cases, the potential to produce gold mineralization is higher in the zones of anomalous fluid flow.

A Case Study

The Dome Mine provides an opportunity to explore in more detail and in three dimensions the relationships between a large gold deposit and one of the smaller upper greenschist zone metamorphic anomalies that occur east and northeast of Timmins (Figures 2 and 3; *see also* Thompson 2004). In Figure 6, the "hot" spot on the surface is marked by a dashed line and the metamorphic zonation reflects variations in grade defined by underground samples. Accepting that sample density is variable and that only 100 thin sections were examined (not included in Table 1), the apparent narrowing of the metamorphic anomaly with depth is quite impressive. The pattern is much less well constrained in the vicinity of the Paymaster Mine to the southwest, but the same linear geometry is present and there it is consistent with petrography and structural analysis completed by Rhys (2003). Projection of the data onto vertical planes parallel and perpendicular to the main structural trend in the area (Figure 7) confirms that the metamorphic anomalies narrow with depth. The available data indicates that the irregular metamorphic pattern characteristic of the region east and northeast of Timmins continues to depths of at

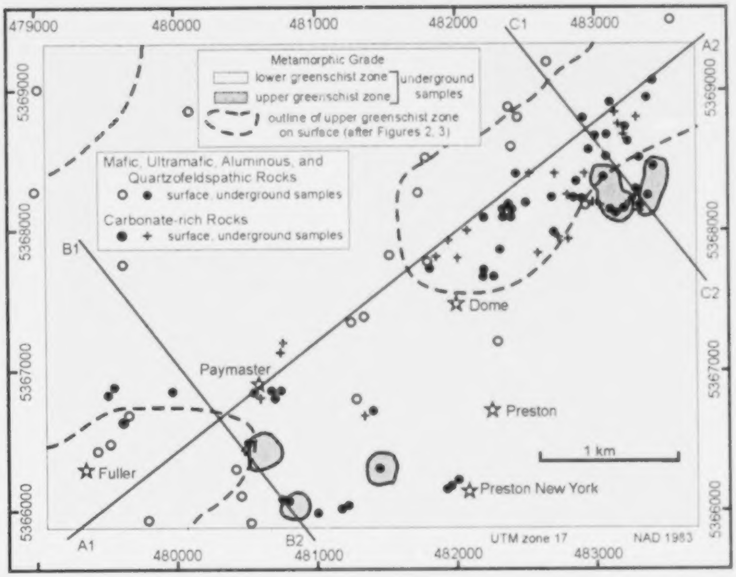

Figure 6. Metamorphic map in the vicinity of the Dome and Paymaster mines. See Figure 7 for profiles A_1-A_2, B_1-B_2, and C_1-C_2. Underground samples and inferred upper greenschist zone metamorphic anomalies projected to the surface along vertical lines.

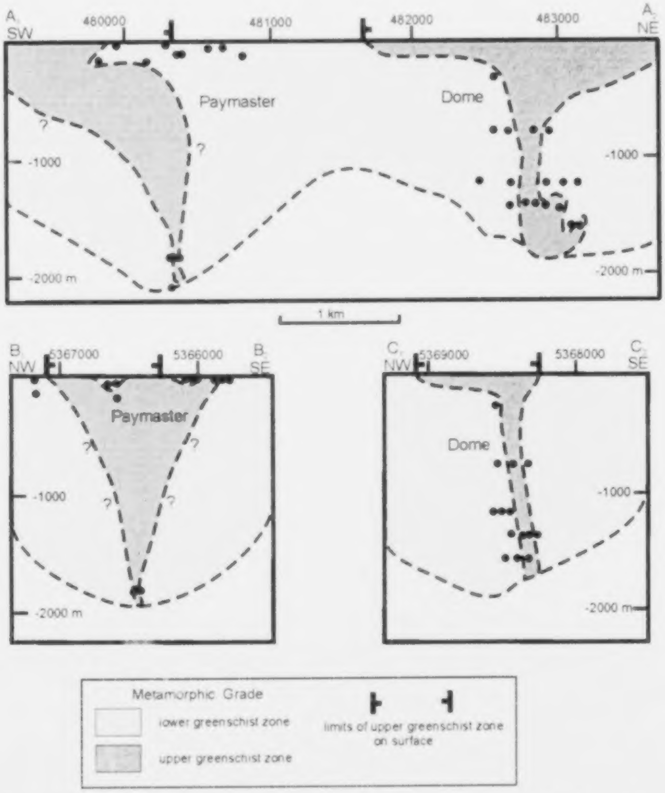

Figure 7. Underground data projected onto vertical profiles oriented parallel and perpendicular to the main structural trend through the Dome and Paymaster mines. Note speculative nature of profiles for the Paymaster Mine.

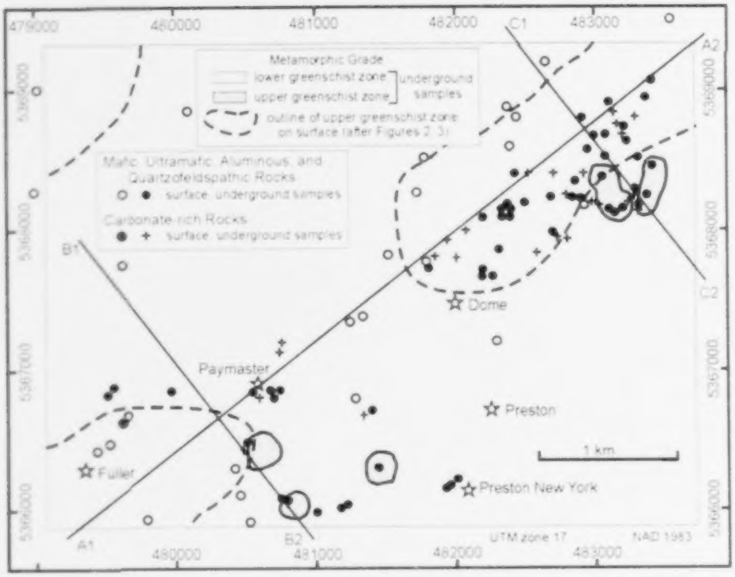

Figure 6. Metamorphic map in the vicinity of the Dome and Paymaster mines. See Figure 7 for profiles A_1-A_2, B_1-B_2, and C_1-C_2. Underground samples and inferred upper greenschist zone metamorphic anomalies projected to the surface along vertical lines.

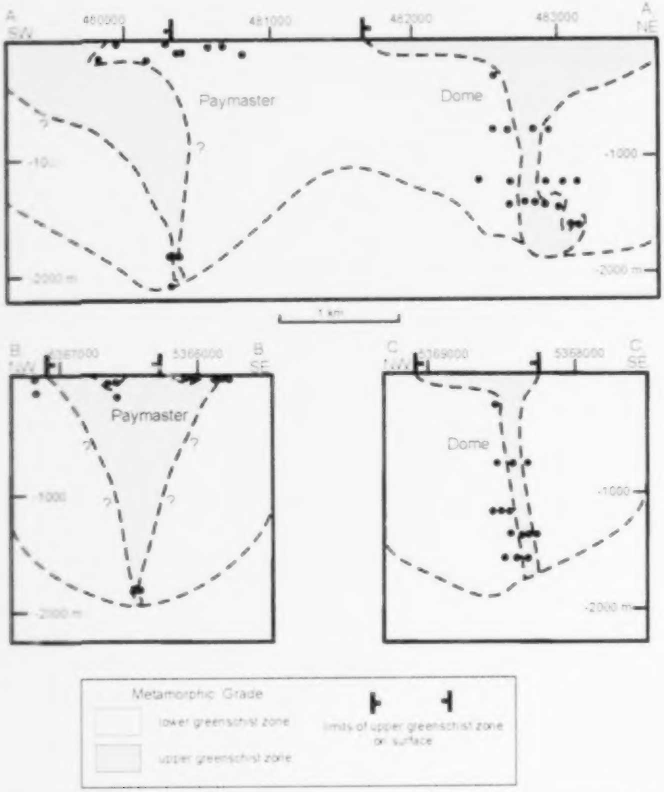

Figure 7. Underground data projected onto vertical profiles oriented parallel and perpendicular to the main structural trend through the Dome and Paymaster mines. Note speculative nature of profiles for the Paymaster Mine.

least 2 km and that the thermal regime to that depth is not a simple thermal dome. The shape of the higher metamorphic grade zone is more linear than planar. I interpret the metamorphic pattern at Dome as the product of a lithostructural conduit that transported anomalously high volumes of fluid through the rocks when peak metamorphic conditions prevailed.

Long recognized as important factors in the targeting of gold exploration, deformation zones and carbonate-rich rocks are also part of the metamorphic story at the Dome Mine. Carbonate-rich rocks, many of them moderately to intensely deformed, occur within and outside the upper greenschist zone metamorphic anomaly (*see* Figure 6). The mine occurs within a regional scale northeast-oriented zone of relatively intense deformation that includes the Destor–Porcupine fault system (Figures 2 and 3). Such structures are capable of acting as conduits for fluid flow. Extensive carbonate alteration is an indication that mineralizing fluids were relatively rich in CO_2. Therefore, the metamorphic anomaly may be, at least in part, a product of relatively high CO_2 content of metamorphic fluids rather than only higher temperatures. Although both carbonate-rich rocks and the major structures extend along strike for tens of kilometres, large gold deposits are rare. Some of the highest ore grades obtained from the Dome and Paymaster mines are associated with the higher grade metamorphic rocks. It is possible that mapping of metamorphic zones provides a means of determining which segments of the regional alteration and deformation corridor have the highest potential for large gold deposits.

Metamorphic Constraints on Geological Setting of Gold Deposits

Geological setting is a key aspect of any attempt to determine where, why and when gold deposits form during the evolution of gold-bearing greenstone belts. Metamorphic data and the concepts designed to explain the origin of metamorphic rocks provide important constraints on the timing, depth, temperature and duration of processes such as magmatism, deformation, and alteration that may be important factors in the formation of major gold deposits.

METAMORPHIC PRESSURES AND TEMPERATURES

Jolly (1978), the author of the impressive first, and to date, only metamorphic study of the entire Abitibi greenstone belt concluded that, for the most part it was transformed by low pressure-type regional metamorphism. That is, andalusite is the stable polymorph of Al_2SiO_5 in aluminous rocks at medium metamorphic grade. From published Pressure-Temperature diagrams (Spear 1993; Bucher and Frey 1994; Thompson, in press (2005)), it is possible to infer approximately the temperatures associated with the regional metamorphic zone boundaries: a) subgreenschist/lower greenschist zones (300°C), lower/upper greenschist zones (400°C), upper greenschist/transition zones (475°C), and transition/amphibolite zones (525°C). Using numerical geothermobarometric methods, Powell et al. (1993) obtained peak metamorphic temperatures and pressures in the range 250 to 270°C and 2.4 to 2.6 kbars from subgreenschist zone rocks in the south-central part of the project area. Application of the hornblende geobarometer to granitoid rocks by Feng and Kerrich (1990) yielded pressures in the range 1 to 2 kbars from components of the alkalic and felsic to intermediate metagranitoids included on Figures 1 and 2 (back pocket). Although the effect of metamorphic recrystallization on the pressure of crystallization obtained was not investigated, such low pressures are consistent with the idea (Sutcliffe et al. 1993; Rowans et al. 1993) that the granitoids are the plutonic equivalents of metavolcanic sequences in the study area. Across most of the map area (*see* Figures 2 and 3), metamorphic temperatures and pressures are inferred to have peaked in the range 300 to 425°C and 2.5 to 3.5 kbars. That is, maximum depths attained during metamorphism by rocks now at the surface were on the order of 7 to 12 km (assuming average density of 2.86 g/cm^3). Within narrow contact metamorphic aureoles associated with granitoids that, for the most part, predate the main regional metamorphism, temperatures in excess of 525°C were attained. Given that Loucks and Mavrogenes (1999) conclude that 90% of the gold mined from metamorphic terranes was deposited at temperatures and pressures in the range 250 to 450°C and 1 to 3 kbars, the peak conditions estimated for the Timmins–Kirkland Lake area are consistent with the wide distribution of gold occurrences and prospects (*see* Figure 2).

METAMORPHISM AND PLUTONISM

A potential source of heat, fluids and/or metals, plutonic magmatism is a key part of the geological framework within which the gold deposits formed. Compared to regional metamorphism, intrusion and crystallization of a pluton is a rapid process that can be dated relatively easily (*see* "Depth-Time Relationships"). Although commonly assumed to be the source of heat for regional metamorphism, plutonic rocks in metamorphic terranes are commonly too old or too young to fulfill this role (e.g., Thompson et al. 1995). In the project area, Jolly (1974, 1978) describes superposition of contact metamorphism of supracrustal rocks previously transformed by a regional subgreenschist grade, burial metamorphic event. Powell et al. (1993) argue convincingly that the subgreenschist grade regional metamorphism occurred during and after the main deformation event had folded all the supracrustal packages and rotated the rock units into a steeply dipping orientation. The latter interpretation is consistent with the present regional petrographic study that indicates all the granitoid rocks have been modified to varying degrees by metamorphism (*see* Figure 2) and with the ages obtained from these bodies. Perhaps re-examination of some of the samples described by Jolly (1974) in the light of this more recent information will reveal that subgreenschist assemblages were imposed on higher grade contact metamorphic assemblages rather than the other way around. In any case, given the very wide extent of the lower greenschist zone, the narrow contact effects associated with exposed granitoids in the southwest half of the project area, petrographic data indicating metamorphism is younger than the granitoids, and the age of those that have been dated, it is unlikely that granitoids are the main source of metamorphic heat on a regional scale.

These relationships can have an impact on the gold exploration models applied to the region. For example, if the main phase of metamorphism is younger than the granitoids, it follows that any gold deposits that are directly related to magmatism (e.g., Rowins et al. 1993) should be metamorphosed as well. In fact, for gold deposits older than regional metamorphism, a magmatic event is the most likely source of fluids and metals.

METAMORPHISM AND DEFORMATION

Given the time and resources available to this project, it is not possible to analyse and interpret properly here the qualitative observations of variable intensity of deformation recorded in Table 1 (Appendix 2). Based on a preliminary look at the data, however, it is possible to make some general statements about the relationship between metamorphism and deformation.

In most cases, wherever there is a preferred orientation of individual mineral grains and mineral aggregates indicating metamorphic recrystallization occurred within a heterogeneous stress field, the minerals are products of the main phase of metamorphism recognized in the rock. That is, the deformation overlapped in time and space with peak metamorphic conditions and it is reasonable to assume that temperatures and pressures estimated from metamorphic mineral assemblages apply to the time when the strain was most intense. This relationship is observed in all four metamorphic zones.

Furthermore, at regional scale and in more detail (*see* "A Case Study"), the metamorphic pattern is discordant to the variations in the intensity of strain. That is, although both processes overlap in time and space, there is not necessarily a direct relationship between high strain and high metamorphic grade. Wherever relatively high metamorphic grade does coincide with a high strain zone (*see* Figures 5 and 6), however, the data in the Timmins–Kirkland Lake area indicate that the coincidence may be significant with respect to the formation of gold deposits (*see* "A Case Study").

METAMORPHISM AND ALTERATION

The relationship between metamorphism and alteration is not straightforward. For the purposes of this project, alteration is viewed as a type of metamorphism (hydrothermal metamorphism) that has a relatively restricted distribution, involves movement of components other than water and carbon dioxide in and out of the rock, and is associated with anomalously high volumes of fluid. It is typically structurally or lithological controlled and may occur before, during or after regional and contact metamorphism. In the course of reconnaissance petrography, samples with atypical mineralogy such as felsic metavolcanic rocks with high white mica content, tourmaline-rich metasedimentary rocks, very aluminous compositions and carbonate-rich rocks were noted (*see* Table 1). Once again, comprehensive analysis of the qualitative observations of the type and intensity of alteration is beyond the scope of this study, but several general statements are included here.

Four hundred and eighty-three of 2373 thin sections (*see* Table 1) were judged to be altered rocks. Carbonate alteration (66%) is more common than white mica alteration (20%) or rocks affected by both processes (11%). Rocks with unusual amounts of tourmaline or chloritoid (3%) were the least abundant. In most cases, textural evidence indicates that alteration occurred before or during metamorphism. There are also localities where moderate to intense alteration is associated with moderately to intensely strained rocks and/or upper greenschist zone metamorphic anomalies. In these cases, structures and/or metamorphic zone boundaries may be the conduit along which the altering fluids arrived. Many altered rocks are associated with known gold occurrences or gold deposits, but a significant number are not, suggesting that alteration alone is not necessarily a useful prospecting tool. Of more interest, possibly, are the places where alteration coexists with evidence of high strain and anomalous metamorphic conditions (*see* "Gold Exploration Target Areas").

DEPTH-TIME RELATIONSHIPS

A Depth-time diagram (Figure 8) is a convenient way to show how metamorphic data and concepts constrain the relative timing, duration, depth and temperature of the other processes involved in the origin and evolution of a gold-bearing greenstone belt. In view of the similar depositional, magmatic, and deformation histories in the Timmins and Kirkland Lake mining camps (*see* Figure 1) and the absence of major changes to the metamorphic pattern across the intervening area (*see* Figures 2 and 3), it is possible to represent the project area with one Depth-time diagram. A key element in its construction is the compilation of available geochronological data (Ayer, Thurston, Bateman, Dubé et al. 2005). The ages obtained from the Timiskaming and Porcupine supracrustal assemblages are combined with those from three suites of granitoids that are distinguished on geological compilation maps of the region (Ayer and Trowell 1998, 2000; Ayer et al. 1999; Ayer et al. 2003) and included on the metamorphic map (*see* Figure 2). These are quartz-feldspar metaporphyry, felsic-intermediate metagranitoids, and alkalic metagranitoids. The metamorphosed state of these rocks is inferred from petrographic data (*see* Table 1).

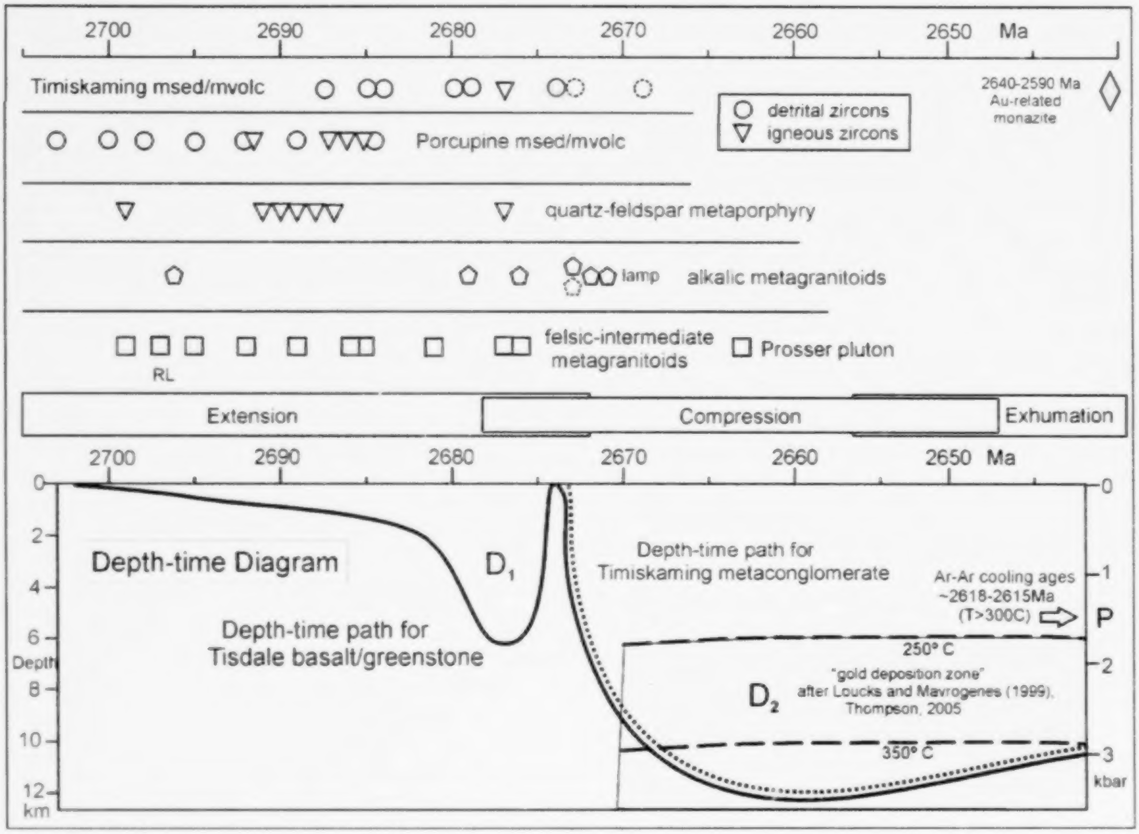

Figure 8: Depth-time diagram illustrating history of two hypothetical samples (Tisdale basalt/greenstone, Timiskaming conglomerate/metaconglomerate) with respect to a simple three stage model of the tectonic evolution of part of the western Abitibi greenstone belt. Geochronology after Ayer, Thurston, Bateman, Dubé et al. (2005), Ayer et al. (2003), Hanes et al. (1989), Schandl and Wicks (1993).

Extension, Compression and Exhumation

For the purposes of discussion, a simplified three phase tectonic scenario is preferred (*see* Figure 8). The first phase corresponds to an extensional tectonic regime characterized by the formation and filling of the supracrustal basin or basins by sedimentary and volcanic rocks and intrusion of related high level plutons. During the second phase, compression and related crustal thickening occur. At some point during the compressional phase the rate of uplift and erosion caused by crustal thickening outstrips the rate of thickening and rocks within the crust begin to cool as they are exhumed back to the earth's surface. The period dominated by exhumation is the third phase of this model history of a greenstone belt.

The duration of the extensional phase is inferred from ages of metavolcanic rocks (Timiskaming and Porcupine assemblages), the related metaporphyry suite, and the metamorphosed alkalic suite. Rowins et al. (1993) argue that the latter formed in an extensional tectonic setting. The overlap of felsic-intermediate metagranitoid ages with those of metamorphosed volcanic and porphyritic rocks supports the contention of earlier workers (e.g., Sutcliffe et al. 1993; Heather 1999) that these rocks are somewhat deeper plutonic equivalents of the felsic metavolcanic and porphyritic rocks. Petrographic evidence indicating that the felsic-intermediate suite is metamorphosed is also consistent with this idea. To account for the structural evidence of significant folding before deposition of the Timiskaming assemblage (Rhys 2003; Bateman et al. 2005), it is necessary to begin compressional deformation before the end of extension. Overlapping of the two processes in this simplified model history may result from the grouping together of rock units that are far enough apart that extension ended and compression began at different times. Alternatively, the transition from extensional to compressional regime involved a period of transpression, a tectonic setting in which both processes occur simultaneously. The time during compressional deformation when exhumation becomes the dominant process and the rate at which it occurs are not well constrained. However, the process was not a rapid one. Rocks subjected to peak metamorphic conditions that ended up at the earth's surface yielded $^{40}Ar/^{39}Ar$ cooling ages in the range 2615 to 2617 Ma (Hanes et al. 1989; Masliwec et al. 1986; Schandl et al. 1991). Evidently these rocks were at depths in the crust where temperatures in excess of 300°C prevailed 40 million years after cooling began at the onset of exhumation (*see* Figure 8).

Tracking the history of two hypothetical rock samples, a Tisdale assemblage mafic metavolcanic rock (solid line, Figure 8) and a Timiskaming metaconglomerate (dotted line), illustrates how metamorphic data can constrain interpretations of the structural history of the region and of the timing of gold mineralization. According to the model, for approximately the first 20 million years after deposition at the earth's surface, the hypothetical Tisdale basalt is buried by the Porcupine assemblage. There is structural evidence for folding (D1) of Tisdale and Porcupine rocks prior to deposition of the Timiskaming assemblage (Rhys 2003; Bateman et al. 2005). Towards the end of D1, the Tisdale sample returns to the surface a very low grade, massive, metavolcanic rock where it is soon buried again by the Timiskaming assemblage, a sample of which is represented by the dotted line (Figure 8). Together, but separated by an unconformity, the two hypothetical samples are transformed to foliated, greenschist facies metamorphic rocks by the increase in temperature and pressure associated with the main deformational event (D2). At some point in time, the magnitude of crustal thickening is sufficient for significant erosion to occur. In the latter part of the compressional phase, exhumation becomes the dominant process and the greenstone and the metaconglomerate start to cool as they begin their long slow return to the earth's surface.

Implications for Deformation and Age of Gold Mineralization

In spite of the limitations related to simplification of a complex history, the Depth-time analysis based on metamorphic data provides a fresh perspective on deformation history and timing of gold mineralization in the Timmins–Kirkland Lake area.

The absence of a prominent, regional foliation axial planar to D1 folds (Rhys 2003) implies that the rocks now exposed at the surface were not buried deeply enough during D1 for a metamorphic fabric to form. The inferred low intensity of this phase of deformation (Figure 8) is supported by petrographic evidence indicating only one major metamorphic event has affected pre-Timiskaming and Timiskaming rock units. If, during D1, pre-Timiskaming rocks were buried deeply enough to become foliated under greenschist grade metamorphic conditions, there should be evidence of two metamorphic events in these rocks and in pebbles of pre-Timiskaming rock units present in the unconformably overlying Timiskaming metaconglomerate. Furthermore, if D1 was comparable to D2 with respect to the magnitude of tectonic burial and metamorphic grade, the geochronological time constraints require some sort of elevator tectonics and rapid exhumation to bring the rocks back to earth's surface prior to deposition of the Timiskaming assemblage.

Isotopic dating of gold mineralization has produced enigmatic results. Fuchsite from the Hollinger Mine (2617 ±10 Ma, Masliwec et al. 1986) and muscovite from Davidson–Tisdale property (2615 ± 4 Ma, Hanes et al. 1989) are presumably giving cooling ages rather than the time of mineralization. Monazite from gold-bearing veins at the Dome Mine (Ayer et al. 2003) yields ages ranging from 2640 ± 5 to 2590 ± 11 Ma. On structural grounds, Rhys (2003) and Bateman (2005) conclude that the main phase of gold mineralization corresponds with a subphase of D2. From the metamorphic perspective, this is a good time, because metamorphic grade was peaking, metamorphic fluid production was at a maximum and, with ongoing deformation, the potential for formation of structural conduits and traps was high. Metamorphic mineral assemblages indicate rocks with a history similar to the hypothetical Tisdale greenstone were well within the range of temperature and pressure favoured by Loucks and Mavrogenes (1999) for gold deposition (*see* Figure 8).

If the felsic-intermediate metagranitoid suite is, for the most part, a somewhat deeper plutonic equivalent of the felsic metavolcanic rocks and quartz-feldspar metaporphyries as indicated in this simplified tectonic model (*see* Figure 8), there must have been a long lasting and regionally extensive magmatic event prior to the onset of orogenesis. The pre-orogenic crustal regime dominated by the plutonic magmatism is best exposed in the region between the Destor–Porcupine and Larder Lake–Cadillac deformation zones (*see* Figures 2 and 3). This is a region containing many gold occurrences but only one past-producing gold mine (Benoit Township) and one gold-rich base metal deposit (Langmuir Township). Perhaps gold within this extensive area is related to pre-orogenic granitic magmatism rather than metamorphism and deformation as it is within the bounding deformation zones. In this case, is it possible that the lack of major mines is a result of looking for the wrong thing? That is, exploration in the past was looking for orogenic gold deposits like those in the deformation zones to the north and south rather than pre-orogenic granite-related gold deposits.

Gold Exploration Target Areas

The new metamorphic map of the Timmins–Kirkland Lake area (*see* Figures 2 and 3) documents, on a regional scale, the spatial relationship between past and present gold producers and the lower/upper greenschist zone boundary that was mapped for the first time in the course of a pilot study near Timmins (Thompson 2002). The more comprehensive petrographic database (*see* Table 1, Appendix 2) improves the definition of the metamorphic boundary at localities covered by the previous work (e.g., Dome Mine, Naybob past producer) and outlines new localities. For example, northeast of Timmins, upper greenschist zone metamorphic anomalies are associated with the Bell Creek, Owl Creek, and Pamour deposits and east of Kirkland Lake small scale anomalies occur near the Eastward and Upper Canada deposits in Gauthier Township. The link between gold mines and upper greenschist zone metamorphic anomalies is clear enough that previously-unknown occurrences of upper greenschist zone metamorphic grade in areas at some distance from known mines merit further attention from gold explorationists.

At one level, the lower/upper greenschist zone boundary is itself a potential target anywhere in the map area (*see* Figures 2 and 3). Of particular interest, however, are localities where the metamorphic boundary intersects a potential structural conduit such as a known deformation zone or rock units with ultramafic or mafic compositions that are known to be effective at precipitating gold from mineralizing fluids. For example, one of the most interesting target areas of this type located in Tully–Prosser–Wark townships (northwest corner, Figures 2 and 3) where a lenticular zone of upper greenschist grade rocks is associated with a northeast-trending fault zone. Note that there are numerous gold occurrences located near the northeast end of this metamorphic feature (*see* Figure 2). On a smaller scale the linear array of metamorphic "hot" spots located between two branches of the Destor–Porcupine fault in Whitney Township is interesting. Two small metamorphic anomalies occur on the Pipestone Fault in Stock Township and one of these anomalies is spatially associated with the Clavos Mine.

As noted above (in "Metamorphism and Alteration"), the coincidence of the lower/upper greenschist zone boundary with samples (*see* Table 1) containing evidence of moderate to intense alteration and/or strain may be important for gold exploration. In this regard, Langmuir Township is characterized by numerous metamorphic "hot" spots, relatively variable strain and zones of moderately altered rocks that are associated with the lower/upper greenschist zone boundary. The combination of a complex metamorphic pattern containing both metamorphic "hot" and "cold" spots and relatively intensely altered and deformed rocks that occurs in Sheraton and Timmins townships (central part of Figures 2 and 3) is a potential multi-parameter target area. In the northeast corner of Eby Township, northwest of the Otto stock, the lower/upper greenschist zone boundary cuts across an area of variable strain and moderate alteration just southeast of the Larder Lake–Cadillac fault zone. In Hearst Township, southeast of Kirkland Lake, the northern boundary of the lower grade boundary of the greenschist zone intersects an area of moderately to intensely deformed rocks that farther north is associated with past-producing Omega Mine.

Conclusions

This regional metamorphic study has provided new constraints on the geological setting of gold deposits in the Timmins–Kirkland Lake area, Abitibi greenstone belt.

- The irregular metamorphic pattern in the project area is attributed to superposition of regional subgreenschist and greenschist grade regional metamorphism on narrow higher grade contact metamorphic aureoles that formed at different times immediately adjacent to felsic porphyries, felsic to intermediate granitoids and alkalic intrusions. The metamorphosed plutonic, volcanic and sedimentary rocks now at the surface reached maximum pressures (depths of 10 km) and temperatures (350 to 450°C) during the main phase of ductile deformation that occurred after deposition of the Timiskaming assemblage. Metamorphic data are consistent with the idea that the pre-Timiskaming phase of deformation was less penetrative and occurred at shallower depths and lower temperatures in the crust.

- Metamorphic mineral assemblages indicate that rocks in the study area were well within the range of temperature and pressure that is favourable for gold deposition for tens of million of years. Clearly, the period when peak metamorphic conditions prevailed and the predominant second phase of ductile deformation was in progress was the most conducive for synmetamorphic (orogenic) gold mineralization. At this time, metamorphic fluid production was at a maximum and ongoing deformation increased the potential for formation of structural conduits and traps. However, in view of the metamorphic data indicating pre-metamorphic ages for most of the intrusive plutonic rocks that are prominent in the southwest half of the project area, perhaps gold exploration models related to granite- and porphyry-related gold should be considered in this part of the area.

The revised and enhanced metamorphic framework provides new targets for gold exploration.

- Subdivision of the greenschist zone using the appearance of biotite in metamorphosed quartzofeldspathic and aluminous rocks and the appearance of amphibole in metamorphosed ultramafic rocks reveals a striking spatial relationship between the metamorphic zone boundary and a significant number of past and presently producing gold mines.

- The lower/upper greenschist zone boundary alone is a potential gold exploration tool. Higher priority targets are defined, however, by the coincidence of metamorphic anomalies defined by the boundary with major structural features, particular rock compositions, and moderate to intense deformation and/or alteration (e.g., Tully, Prosser and Wark townships; southwest corner of Bristol Township).

- Metamorphic anomalies may be a tool for determining which segment of a regional-scale deformation or alteration zone has the highest potential to contain a large gold deposit (e.g., Pipestone Fault in Stock and Dundonald townships)

Recommendations

- A regional scale project of this kind must balance the conflicting demands of covering the designated area and of obtaining a data density adequate to define reasonably well-constrained metamorphic exploration targets. Definition of many of the metamorphic anomalies with gold potential that are outlined on the metamorphic map of Timmins–Kirkland Lake can and should be improved with additional sampling in key target areas.

- More comprehensive analysis and interpretation of the spatial relationships between the intensity of strain, the type and intensity of alteration, and metamorphic zone boundaries derived from the qualitative observations recorded in the database in Table 1 should be done.

- The low density or absence of data in the northwest, south-central and northeast sectors of the current map should be addressed and metamorphic mapping extended to the north and southwest in Ontario and eastward into Quebec.

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Appendix 1

Terminology

Appendix 1: TERMINOLOGY

Applied metamorphic petrology is the application of metamorphic data and the concepts used to explain the origin of metamorphic rocks to the reconstruction of the origin and evolution of mountain belts, Precambrian shields and of ore deposits therein.

Metamorphism refers to the changes in mineralogy and texture that occur when a sedimentary, igneous or metamorphic rock is subjected to physical conditions (temperature, pressure, fluid composition) that are different from those when the rock first formed.

Metamorphic grade is a relative measure of the intensity or completeness of metamorphism. The changes occur in minerals making up the rock (mineral assemblages), in textures (grain size and shape, relationships between mineral grains), and in structures (planar and linear aggregates of minerals such as cleavage, foliations, folds, veins, compositional layering that are pervasive throughout the rock). Variations in grade are evident at the scale of the map, outcrop or thin section.

An **isograd** is a line or surface of constant metamorphic grade. Commonly mapped as the first appearance of a mineral or mineral assemblage in rocks of similar composition, isograds mark the boundaries between metamorphic zones.

In general, and neglecting the addition or subtraction of small amounts of water or carbon dioxide, **rock composition** does not change during regional and contact metamorphism. Rocks of different composition such as shales, basalt, and tonalite respond differently to increasing metamorphic grade. This means that specific stratigraphic markers or pre-metamorphic hydrothermal alteration zones can be mapped from the lowest to highest grades in metamorphic terranes. Furthermore, variations of mineral assemblage with composition at constant grade mean each rock type develops a distinctive set of isograds. Although fluid composition variations may complicate the picture, in general, isograds in different compositions are concordant.

Metamorphic zones are descriptive features defined by characteristic minerals or mineral assemblages in rocks of similar composition (e.g., greenschist, transition, and amphibolite zones in metabasalt/gabbro; lower and upper greenschist zones in metamorphosed quartzofeldspathic rocks, see digital map of Figure 2 in MRD 155 (Ayer, Thurston, Bateman, Gibson et al. 2005).

A **metamorphic facies** refers to a range of temperature and pressure that has produced characteristic mineral assemblages in a variety of rock compositions. For example, upper greenschist facies is defined by the occurrence of chlorite + epidote + actinolite + albite in mafic rocks, chlorite + muscovite + biotite in aluminous metasedimentary rocks, and talc + calcite in siliceous dolomitic metacarbonates. In the Abitibi greenstone belt, the boundary between the greenschist and amphibolite facies occurs within the transition zone as defined in metabasites. That is, the greenschist zone and lower grade part of the transition zone represent greenschist facies metamorphic conditions and the upper transition and amphibolite zones represent amphibolite facies conditions.

Regional metamorphism occurs across thousands of square kilometres and lasts tens of millions of years. The transformation is caused by the heating and deformation of rocks during events that shorten and thicken the crust beyond a normal value of 35 km (orogenesis).

Contact metamorphism results from heating near an igneous intrusion. Duration is in the range of thousands to hundreds of thousands of years. Contact metamorphic zones are typically centimetres to a kilometre or two thick. The magmatism that drives the process may or may not be related to orogenesis.

Hydrothermal Metamorphism (metasomatism/alteration) involves the movement of volatile and nonvolatile elements in and out of a rock. Typically structurally controlled and of limited distribution (centimetres to hundreds of metres), the time frame of alteration is likely to be similar to that for contact metamorphism, but could be of long duration as well. Hydrothermal metamorphism is not necessarily associated with orogenesis. It can occur long before, during, or after regional and contact metamorphism in greenstone belts.

Temperature increasing with depth in the crust or with proximity to an igneous body is a principal cause of the changes observed in metamorphic rocks. **Pressure** on solid components of rocks increases with depth in the crust at a rate dependent on the average density of overlying rocks (crustal average - $2.857 g/cm^3$, ~ 0.02857 GPa/km, ~ 0.2857 kbar/km). For most natural systems, pressure on the intergranular fluid phase (P_{fluid}) during regional and contact metamorphism is assumed to equal P_{solid}.

P-T diagrams are orthogonal plots of temperature and pressure that incorporate the above assumptions about fluid pressure and generally include the assumption that metamorphic fluids are 100% water. Plotted on such a diagram, stability fields for key metamorphic mineral assemblages constrain estimates of the P-T conditions of metamorphism. A traverse perpendicular to isograds in a metamorphic terrane is represented on a P-T diagram by an **erosion surface P-T array** (metamorphic field gradient of Turner (1981).

Geothermal gradients are the increase of temperature with depth in the crust. Making an assumption about the average density of the crust, it is possible to relate lithostatic pressure (P_{solid}) to depth and calculate the geothermal gradients implied by metamorphic grade and the magnitude of post-metamorphic **exhumation** (uplift and erosion).

Depth-time diagrams (Thompson 1989a, 1989b, 2002) illustrate the evolution of metamorphic rocks with respect to changes in temperature and depth (pressure) during deposition, deformation, mineralization, metamorphism and exhumation of greenstone belts.

The **"gold deposition zone"** (Thompson 1999, 2002) is derived from the conclusion of Loucks and Mavrogenes (1999) (they cite Hodgson et al. 1993; Phillips et al. 1997) that 90% of the gold mined from metamorphic terranes around the world was deposited between temperatures of 250 and 450° C and pressures of 1 and 3 kilobars.

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Appendix 2

Petrographic Data

Legend For Petrographic Data (Table 1)

Rock Association-Metamorphic Grade (ragrd, e.g., 12)
First number, rock association (from 1 to 9)
Second number, metamorphic grade (0-subgreenschist to 3-amphibolite zone)
Rock associations:
1 - metabasites
2 - metaquartzofeldspathic rocks
3 - metaultramafites
4 - metamorphosed aluminous rocks
5 - chemical metasediments (e.g., iron formation)
6 - metagranitoids
7 - metamorphosed carbonate-rich rocks
8 - unmetamorphosed granitoids
9 - rock association unknown
Metamorphic Grade
0-3 - higher number = higher grade for each association
note: subdivision of grade is unique to rock association, e.g., four divisions in metabasites (10-13), four in metaquartzofeldspathic rocks (20-23)
Mineral Name Abbreviations
act - actinolite
afp - alkali feldspar
am - amphibole
ap - apatite
bt - biotite
cb - carbonate
cht - chlorite
cpx - clinopyroxene
crs - crossite
ctd - chloritoid
cum - cummingtonite
^{d} - detrital
epg - epidote group (epidote, clinozoisite, zoisite)
fp - feldspar
gra - graphite
grt - garnet
gru - grunerite
hn - hornblende
kf - potassium feldspar
mt - magnetite
mz - monazite
m/z - monazite and/or zircon
ol - olivine
op - opaque
ox - oxide
plg - plagioclase (-ve = relief negative to qtz, sodic)
phl - phlogopite
prn - prehnite
ps - pseudomorphs
pu - pumpellyite
qtz - quartz
^{r} - relict mineral
ru - rutile
se - serpentine
stp - stilpnomelane
su - sulphide
tit - titanite
tlc - talc
to - tourmaline
un - unknown
wm - white mica
zi - zircon
Mineral Name Modifier
agg -aggregate
aft - after, e.g., cht aft bt
clss - colourless, e.g., am (clss)
"plg", plg" - plg pseudomorphed, partially pseudomorphed
plgrn - pale green; brn - brown, bl - blue
2cb - two carbonate minerals present
? - presence uncertain
-ve - negative relief with respect to qtz
Rock Name, Modifier Abbreviations
amyg - amygduloidal
altd - altered, cbaltd - cb alteration, wmaltd - wm alteration
clsl - calcsilicate
fel - felsic
fgr - fine-grained
fol - foliated
fp - feldspar, e.g., feldspar metaporphyry
intm - intermediate rock compositions
m - meta
m? - metamorphic state uncertain
maf - mafic
maltd - metamorphosed alteration
mclastite, mclte - metaclastite
metabasite - metamorphosed basalt/gabbro
metaclastite - metamorphosed clastic texture/synmeta gsr
metamin - metamorphosed mineralization
multramafite - metaultramafic rock (mumaf)
mporphyry, mporph - metaporphyry
mtuff - metatuff
phyl - phyllite
qf - quartz-feldspar
txt - texture
vfgr - very fine-grained
xl mtuff - crystal metatuff
Deformation (DEFM)
anld - annealed
cren - crenulated, crenulation
c-s - C-S fabric
defmd - deformed
flld - folded
hsz - high strain zone
gb - grain boundaries
gsr - grain size reduction
ll - parallels
lyr, lyrd - layering, layered
mrtxt - mortar texture
msv - massive
po - preferred orientation; w, m, i - weak moderate, intense minerals or aggregates of minerals defining po are indicated
polygd - polygonized
Pshads – Pressure shadows
S_L - late foliation postdates S_M
S_M - main foliation
sutd - sutured grain boundaries
vn – vein
w/ - with
Alteration (ALT)
w, m, i - weak, moderate, intense
cb - carbonate alteration
k - potassium alteration
prem - premetamorphic alteration
wm - white mica alteration (K-mica, Na-mica)
Column Headings
XEAST3 - UTM easting NAD 1983
YNORT3 - UTM northing NAD 1983
SAMNUM - sample number
RAGRD - rock association - metamorphic grade
DEFM - deformation
ALT - alteration
RKPETROG - rock type from petrography
MORETEN - modal percentage greater than 10
ONE2TEN - modal percentage between 1 and 10
LESSONE - modal percentage less than 1
NOTES - comments, notes

Table 1. Petrogrographic data for the metamorphic map of the Timmins-Kirkland Lake area.

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
572393	5371219	21	85AB-02	wpo		felsic metatuff	fp-qtz		wm-cb	
528942	5375469	11	85AB-23	msv		metabasite(diabase)	cpx′-plg′	op	btr-cht-epg-act	cht-epg-act likely meta, Matachewan diabase
528942	5375469	11	85AB-24	ipo gsr too fgr		metabasite	plg-cht-epg	qtz	op	no act?, too finegrained
528942	5375469	11	85AB-26	hsz		metabasite	epg-cht-op		act	act just getting going
528942	5375469	11	85AB-27	veins		metabasite	epg-cht-op	fp-qtz-cb		Bathe noted prn, likely epg
528942	5375469	21	85AB-28			metafelsite	plg-qtz	wm-cht	op-epg?	wonder about sgz,
533117	5369519	11	85AB-31	hsz		metabasite	cht-epg-plg	act-cb-op		ep-rich zones = ipm?
533117	5369519	11	85AB-32	hsz		mafic metaclastite	cht-epg	act-cb-op		
533117	5369519	10	85AB-33	wpo		mafic metaclastite	cht-epg-pu?	op-plg-qtz	cb	sgz if pu is present, assuming this is so
533117	5369519	11	85AB-34	lyrd		metabasite	plg-epg-act	cht-op	cb-tit	lots of act, very lge epg grains
533117	5369519	11	85AB-40			metabasite	plg-cht-epg	act-op		looking lower grade
547717	5385844	32	85AB-48			metaultramafite	se-am-cpx′-op	ol?		
547717	5385844	11	85AB-49	msv		metabasite	plg-act-epg-cht	op		lots plg microlites, fibrous radiating act
547717	5385844	21	85AB-50	msv		felsic metaporphyry	plg-qtz-cht	bt′-cb	ru	red-brn bt going to cht-op-ru?
547717	5385844	41	85AB-52	wpo cht, agg		phyllite-metamudst	cht-op	qtz	epg	
547717	5385844	32	85AB-55	msv		metaultramafite	cpxr-act-cht	op		
547542	5384019	31	85AB-61	fractured	icb	metaultramafite	wm(tlc)-cb-cht		op	cbaltd metabasite possible
546342	5384519	11	85AB-70	msv		metabasite	am(blgrn/grm)-cht-epg	cb	tit-op	
546342	5384519	11	85AB-71	msv fracts		meta-anorthosite?	plg″-epg	wm(aft plg)	op	possibly metabasite
546342	5384519	61	85AB-72	msv		alkalic metaporphyry	afp	cht-cb-act?	2tit-ap-zi-stp?	cht-cb ps after?, tit′ + tit meta
546342	5384519	11	85AB-77a	msv		intm metabasite	plg-cht	act-epg	op	unusual plg texture
539767	5376869	11	85AB-83b	msv		metabasite	cht-epg-act	plg	op	
539767	5376869	11	85AB-86a	msv		metabasite	cht-epg-act		op-cb-tit	act in blebs w/ cht-cb
539867	5374994	11	85AB-89a	msv		intm metaporphyry	fp-qtz	cht	op-epg-act?	21 or 11
539867	5374994	11	85AB-90	msv to mpo		metabasite	epg-cht-act	cpx′?	op	am in veins, polygd qtz vn, mpo is primary?
539867	5374994	21	85AB-106b	w-mpo clasts		intm metaclastite	wm-cht-plg	qtz	op-tit	
541492	5370769	11	85AB-108	msv		metabasite	plg″-am(blgrn-grn)	wm(aft plg)	op-tit-cht	
541492	5370769	22	85AB-113	wpo bt, cht		qf metaclastite	plg-qtz-cht	bt(vfgr)	op-epg	
555292	5376744	21	85AB-116	wpo wm, clasts		metaclastite	fp-2cb(one rusty)	wm-qtz-op	cht	could be 71 too
555292	5376744	71	85AB-121	mpo wm, clasts		metaclastite	cb-fp-wm	cht	op	could be 21 too
557667	5377386	71	85AB-127		icb?	mafic metabreccia	cb-fp-qtz	wm-cht	op	
557667	5377386	71	85AB-128	wpo clasts	icb	metaclastite	cb-qtz	wm-cht	op	icbalt or primary cb
580443	5368369	21	85AB-135	mpo agg		felsic metaclastite	plg-qtz-wm	cb-cht-op	ap	
580443	5368369	21	85AB-140	wpo clasts		metaclastite	plg-qtz-wm	cb	cht-op	
546892	5362169	11	85AB-149	msv		metabasite(gabbro)	act-wm-cpx′-plg′	cht-epg	op	some colour variation in am, act agg aft cpx

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
555067	5376319	21	85AB-168	msv	mcb	meta-altd porphyry	fp-cb-wm		op-ru	alt is pre- or syn-metamorphism
577093	5362019	62	85AB-174a	msv	mwm	meta-alkalic ign rock	am(bl-vio)-fp-wm	cht(grn)-op-tit		wmalt of fp, likely was plg, am = 62
577093	5362019	21	85AB-180	mpo wm-cht		metafelsite	fp-qtz	wm	cht-op	fiamme?
577093	5362019	11	85AB-186	msv		metabasite(diabase)	"plg-act(grn)	op-tit-wm(aft plg)		definitely metadiabase what age?
519167	5377644	71	85AB-187	ipo cht, cren	cb?	cb-cht schist	cb-cht		qtz-plg	folded cb vn, pre- or syn-meta cb alt?
547217	5368244	22	85AB-221a	msv		fels/intm metavolc	plg-bt	cht-qtz	op	
547217	5368244	11	85AB-223	msv		metabasite/intm	plg-act(grn)	qtz	op	
554667	5377619	71	86AB-21	mpo cht, agg	icb	cb-cht schist	cb-cht	qtz-wm	op	meta cbaltd basalt, pre/syn meta alt
554667	5377619	21	86AB-27	msv	mcb	meta-cbaltd felsite	plg-cb-wm	cht-qtz		NB cb-wm pseudos, ex plg?
553417	5378169	41	86AB-36	mpo mica, cren		metasiltstone	qtz-fp-cht-wm-cb		to-op-ap	NB to
552992	5378919	71	86AB-51	w-mpo agg	wmcb	meta-altd intm mvolc	plg-cb-wm	cht	to-op	NB to probably wm-cb alted pre/syn meta
593368	5375544	71	86AB-78	msv, plygd vn		meta-altd basite	plg-cht	wm-qtz	op	polygonized qtz vn, could be almost 41
545117	5377109	11	86AB-79	msv		metabasite	act-plg	epg-qtz	op	
550842	5377475	71	86AB-86	ipo agg	icbwm	cb-rich metabasite	cb-wm	cht	op-to	NB to, cht augen wrapped by wm-cb
525617	5388469	71	86AB-103	ipo cht, agg	mcb	meta-cbaltd basite	cht-cb	tit	op-stp	stp assoc with cb amygs
525617	5388469	10	86AB-111	msv		metabasite(diabase)	cpx'-plg'		cht-wm-op	diabase if meta likely 10, wm-cht = meta
525617	5388469	11	86AB-116	mpo cht, agg		metabasite	epg-cht		op-stp	no act, with stp 11 ok, could be maltd basite
519167	5377644	71	86AB-121	mpo cht, agg	mcb	cb-cht phyllite/hsz	cb	cht-qtz		
577043	5369969	71	86AB-145	variable po		meta-cbaltd basite	plg-cht-cb	wm-qtz	op	polygd qtz vn; po=cht, agg;
584343	5364844	21	86AB-153	msv		metafelsite	fp	op	wm-cht-cb	
583043	5364219	11	86AB-169	msv		metabasite	am(blgrn-grn)-cht-epg		op	
607268	5368669	61	86AB-179	msv		metagranitoid	plg"-qtz	epg	cht-tit-bt'-wm	wm aft plg,
607268	5368669	11	86AB-180	msv		metabasite	plg-cht-epg	act	op	
570793	5370694	71	86AB-191	wpo	ichtcb	meta-altd basite	cht-wm-cb		op	intense cht-cbalt (pre/syn meta) or primary cb
570793	5370694	61	86AB-192	gsr		alkalic metagranitoid	afp-qtz		cpx'-act-tit-op	assuming act makes it 61
576293	5373369	21	86AB-211	wpo agg		metasandstone	plg-qtz-wm	cht		
537542	5369144	52	86AB-215	wpo act, agg		chem metased/Fe form	plg-qtz-am(pale grn)	cht-op-tit		11 if it is mafic rock
537542	5369144	11	86AB-224	wpo agg		metabasite/intm	plg	cht-act-op-tit	qtz-cb	act is acicular
590193	5368669	11	86AB-245	msv		metabasite	epg-act-cht	plg	op-tit	
552992	5369744	41	86AB-247	msv		meta qtz arenite	qtz	wm	cht-op-oxide	41?, cht-op aft?
522892	5386088	21	86AB-253	mpo agg		fel metahyaloclastite	plg-qtz	wm-cb	cht-op	metabreccia
534867	5387669	21	86AB-261	mpo cht wm		felsic metaclastite	plg-qtz	wm-cht	ru	
534867	5387669	71	86AB-266a	msv	icb	metabasite	cht	cb	op	metaglass present
534867	5387669	71	86AB-278	msv	cht	metabasite	plg-cht	cb	tit	cb amygdules
594068	5373844	21	87AB-01	msv	m cb	metafelsite	fp-qtz-cht-cb	kf?	op	21 if kf present, 71 also possible
538957	5368769	11	87AB-22	msv		metabasite/intm	plg-act(pale grn)	cht	tit-op-epg	

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
541417	5367869	11	87AB-26	msv qtz vn		metabasite	am(pl grn)-plg	cht	tit	
541417	5367869	41	87AB-28	wpo cht		mafic metaclastite	cht-plg-qtz-op(py)		epg	high cht content, lots op, 41 is possible
550192	5377994	41	87AB-51	wpo lyrd		metasiltstone	wm-cht-qtz-plg?		op	
551442	5377144	21	87AB-58	wpo agg	m cb	metawacke	plg-qtz-wm-cb	cht	op-ru	cbalt is pre/syn metamorphism
557042	5377744	71	87AB-73	msv	m cb?	cb-rich metaigneous rk	cb-plg	wm-cht	op	
557042	5377744	11	87AB-79	msv		metabasite	act-plg	cht-epg-cpx'	op-tit(fuzzy)	
594068	5373844	71	87AB-113	msv veined		cht-cb rock	cht-cb	qtz-plg	op	
594068	5373844	21	87AB-155			metaclastite	cht-plg-qtz-wm	cb(matrix, vns)	op	
514442	5384619	11	timmins 1-1	msv		metabasite	act-epg-plg-cht	qtz	op-tit	tit rims on op and as discrete grains
514442	5384619	11	timmins 1-2	msv		metabasite	plg-act-cth-epg	cpx'	op-tit-qtz	
514442	5384619	31	timmins 1-3	mpo se		metaultramafite	se	op		some relict ign texture pseudomorphed by se
514442	5384619	32	timmins 1-4	msv		metaultramafite	cht-am(clss)-se	op-cpx'		
514442	5384619	71	timmins 1-5	w-mpo agg cren	cb?	wm-cb-cht schist	wm-cb-cht			likely ex-ultramafite, NB cren of main foliation
514442	5384619	21	timmins 1-6	mpo cht, agg		intm metaclastite	qtz-plg-cht		wm-m/z	extensional qtz vn
514442	5384619	71	timmins 1-7	mpo agg, cht	cb?	cb-cht metaclastite	cht-cb-qtz-plg		op-m/z	cb primary or pre/syn meta cbalt?
514442	5384619	21	timmins 1-8	mpo agg, qm		metaclastite	cht-wm-qtz-cb		op	ts too thick, vfgr matrix; cb/qtz vns
514442	5384619	71	timmins 1-9	mpo agg	m cb	metafelsite	qtz-cb-plg	cht	op-wm	moderate cbalt pre/syn-metamorphic
514442	5384619	71	timmins 1-10	wpo agg	m cb	cht-cb metaclastite	cht-cb	plg-qtz-op	kf?	
514442	5384619	21	timmins 1-11	mpo agg, wm		metaclastite	fp(plg-kf?)-qtz	wm-cht	cb-op	
514442	5384619	71	timmins 1-12	wpo agg	m cb	intm metaclastite	cht-cb-fp(plg?)	op		cbalt or primary cb, cht aft bt possible
514442	5384619	71	timmins 1-16	ipo cht,wm,agg	m cb?	cb-cht-wm schist	cht-cb-wm	plg?	op	likely meta-cbaltd-ultramafite
452017	5356419	22	timmins 1-23	msv	cb	metafelsite	fp(plg-kf?)-epg	qtz	wm-cb-op	pre-metamorphic cbalt to epg possible, no cht
480671	5367122	71	timmins 1-25	mpo agg	w cb	metabasite(intm)	cht-plg-qtz	epg-cb	op	wcbalt, pre/syn-metamorphic
459190	5859088	21	timmins 1-28	msv		intm/fels metaclastite	plg-qtz-cht-wm(grn)	op		ts in poor condition
474880	5367485	21	timmins 1-44	mpo wm,agg		felsic metaclastite	wm-qtz-fp	cb	op(gra mostly)	
454475	5361066	41	timmins 1-51	ipo wm,agg	m cb	cb-wm schist	wm-cb-qtz		ru	cb augen, cb aft plg phenos?, pre/syn meta
478049	5365159	11	timmins 2-70	mpo agg		metabasite/ultramafite	cht(mg)-clz-am(clss)		cb-op	abundant clz says no to ultramafite
494392	5361729	41	timmins 2-73	mpo wm,agg	m cb	wm-cb-cht schist	wm-qtz-cb	cht(purple biref)	op	cbalt pre/syn metamorphic
475010	5363338	21	timmins 3-137	msv	w cb	metafelsite	plg-qtz-kf?	wm-cb-op		wcbalt, pre/syn-meta, no cht, wm-cb, no epg
494092	5358969	21	timmins 3-150	msv	m cb	metafelsite	plg-qtz-kf?	cb-cht-wm	ru-m/z	moderate cbalt pre/syn-metamorphic
514442	5384619	11	timmins 3-153	msv		metabasite	cht-plg	cpx'-epg	tit-act	
491514	5374415	21	timmins 3-162			metafelsite/intm	fp-qtz-cht-kf?	stp	to(brn)-op-tit	vfgr matrix, spectac stp plates, NB to(brn)
457099	5373271	71	timmins 3-171	msv	m cb	meta-cbaltd basite	plg-cb-cht	qtz-op-ru		likely meta-cbaltd-basite/intm
458306	5372774	21	timmins 3-186	msv		metawacke/cgr mclste	wm-plg-qtz	cht-cb(rusty)	op	rusty edges on cb
538377	5455719	12	timmins 3-188	msv		metabasite	am(blgrn/clss)-plg		op-tit	am is colour zoned, blgrn on clss, plg OK
538377	5455719	11	timmins 3-187	msv		metabasite	act-"plg"-un(aft plg)		op	plg completely gone to un vfgr agg

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
538377	5455719	12	timmins 3-190	msv		metabasite(gabbro)	plg-am(heterog)	qtz-wm(aft plg)	op-ap	
481426	5361899	11	timmins 3-203	msv		metabasite	act-epg-cht		op	
481426	5361899	11	timmins 4-204	msv		metabasite(lampro?)	plg-bt-am(clss)			bt agg aft ign bt likely, am overgrows bt-plg
538377	5455719	32	timmins 4-210	msv, cb hsz		metaultramafite	cth-tlc-am(clss)	op		NB cb hsz
538377	5455719	11	timmins 4-211	msv		metabasite(lampro?)	plg-cb-cht-bt	op		metalamprophyre I think
538377	5455719	11	timmins 4-212	msv		metabasite	act-epg(brn)-cht	plg"	qtz	
513867	5389319	31	timmins 4-214	msv		metaultramafite	se	op		
513867	5389319	31	timmins 4-215	msv		metaultramafite	se	op-cpx′		
513817	5389519	11	timmins 4-248	msv		metabasite	plg-epg-act-cht	cpx′	op	
477507	5369788	21	timmins 4-265	msv	w cb	fels fp metaporphyry	plg-qtz-wm-kf?	cht-cb	op-m/z	lots fp phenos, wcbalt aft plg, pre/syn meta
477507	5369788	21	timmins 4-267	wpo wm	w cb	felsic metaporphyry	plg-qtz-wm-kf?	cht-cb	op	seams of wm, tails on phenos, alt=pre/syn met
477507	5369788	21	timmins 4-268	mpo wm,agg		fels qfp metaporphyry	pkg-qtz-kf?-wm		op-cb-cht	extens vns, py w/ qtz fibre tails
562517	5377219	32	timmins 5-293	msv		metaultramafite(pyrox)	cpx′	cht-act	bt′-op	act=32 in this rk
562517	5377219	31	timmins 5-291	msv		metaultramafite	se-op-cht(mg)		cpxr-bt/phl(relict)	bt likely stable but relict, spectac pseudos
562517	5377219	31	timmins 5-295	msv		metaultramafite	se	op		contrast with previous sample wrt grade
562517	5377219	31	timmins 5-296	msv		se-op				
472517	5370219	22	timmins 5-354	msv		felsic metaclastite	plg-qtz	bt-cb	cht(aft bt)	ts in poor condition, if bt is relict not 22
472517	5370219	21	timmins 5-355			felsic metaclastite	qtz-plg-epg	cht	wm-op-cb	21 with epg
469533	5394154	11	AB07603	msv	iwm	metabasite	wm(aft plg)-epg-cht	tit	op-cb	iwmalt of plg, cb euhedral + patches
469494	5394158	11	AB07605	msv		metabasite(diabase?)	cpx′-plg′	epg?aft plg-op	bt′-cht-act-tit	
469357	5394176	11	AB07612	msv, cht vn		metabasite	epg-act-cht	tit	op	
469348	5394177	11	AB07613	msv	m cb	metacbaltd basite	cht-epg-cb	act-plg-op	qtz	significant cb alt during or prior to meta
469308	5394182	11	AB07615	msv, cht-act vn		metabasite	act-cht-epg		op-tit	
469304	5394182	21	AB07616	mpo agg		mafic metaclastite	cht-wm-plg-qtz	stp(grn)	cb-op	NB stp
469295	5394183	21	AB07618	mpo wm,agg		felsic metaclastite	qtz-plg"-wm-kf?	epg(aft plg)	cht-op	fgr epg agg aft plg, 21 with epg
469286	5394184	21	AB07619	w-mpo wm,agg		felsic metatuff	plg-qtz-wm-epg	cht	op-tit	good resorbed qtz, 21 with epg
469266	5393966	21	AB0720	msv-wpo agg		intn-fels metavolcbrx	plg-epg-cht	qtz-cb	op-tit	no wm, 21-11 w/ epg
469260	5394189	11	AB07623	msv	wm cb	intm metaporphyry	epg-plg-wm-cb		op-tit	cb in matrix + vn, wmalt of plg
469243	5394191	21	AB07625	wpo agg	wm	metawacke(wmalt)	wm(aft plg)-plg"-qtz	epg-op-cht	tit-act	op as graphite + other, op as detrital grains?
469226	5394193	11	AB07627	mpo cht, agg		metabasite	act-cht-epg-plg	tit		cht amygs, cht vein
476174	5399266	11	AB08254	msv		intm metavolcanic rk	plg	cht-tit?	op-cb-epg	no act, little cht so 11
476167	5399224	11	AB08256	msv, cb vn		intm/mafic metavolc	plg-epg		op-tit-cb	no act, little cht so 11
477586	5399571	41	AB08311	ipo wm		wm schist	wm-qtz	epg	op-cb-cht	graphitic, cb as seams + rare augen
477576	5399496	71	AB08320	wpo in matrix	wm	mcbaltd intm porphyry	plg"-cb-epg	qtz-wm-cht	op	brx?, wmalt of plg, clast of porph in matrix
476307	5399278	71	AB08328	hsz zones, gsr	icb	mcbaltd basite/intm	epg-cb-plg	fgr seams un	qtz-cht-op-wm	icbalt, parts 80% epg(clz), fgr brn seams=?
476307	5399263	11	AB08329	mpo gsr	wcb	intm metavolcanic rk	plg	cb-ru	op-cht	plg augen, agg, gsr give mpo

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
476307	5399259	21	AB08331	mpo agg, cbvn	cbwm	mcbaltd intm volcanic	plg-cb-wm	cht	ru	cb vns perpendic mpo,
471833	5389879	21	AB09046	mpo wm cht ag		felsic metaclastite	plg-qtz-wm	cht	op	
471108	5389854	21	AB09242	mpo wm agg		metawacke	plg-qtz	wm-cht	tit-op	clasts also part of mpo
471263	5390089	21	AB09246	m-ipo wm, agg		metawacke	qtz-wm-plg	cht epg?	tit-op	wm, mineral aggregates, clasts = mpo
472967	5389839	21	AB09250	i-mpo wm agg		qtz-rich metawacke	qtz-wm	plg-epg	op-cb	cht rare, epg as tiny prisms
473367	5389839	21	AB09444	m-ipo wm, agg		felsic metaclastite	qtz-plg-wm	cht-epg?(vfgr)	op-tit	ts a bit thick, cht very grn
473767	5389839	21	AB09447	m-wpo wm, ag	mwm	felsic metaclastite	qtz-plg-wm	cht	tit-op-cb	mwmalt of plg
474167	5389839	21	AB09676	ipo wm, agg		felsic metawacke	wm-qtz-plg	epg?-cht	op	vfgr high relief aggregs, likely early epg
476885	5392779	71	AD00021		cbwm	mcbwmaltd felsite?	wm-cb(poiks)-fp-qtz	ru	op-to-cht	fels?, NB lots ru, i wm+cb alt, pre/syn meta? Pshad
476089	5397203	21	AD06104	mpo wm, agg	to ctd	metafelsite	qtz-plg-wm	cht-op-ctd	to	photo op, ctd w/ su-cht vn, vn defmd polygd
476167	5397229	41	AD06149	ipo wm, agg		fel metaclastite/schist	wm-qtz-plg-cht	cb	ap-z-op	cht ps aft?, lots ap, 21? 71?
465282	5388549	11	AE08801	msv		metabasite	act-epg	cht	tit-op	epg amygs
465682	5388549	71	AE08802	msv but defmd		cb-qtz-fp rock	cb-qtz	fp	cht-wm-op-epg	metamorphosed cb alt?
464857	5388574	11	AE08803	msv		metabasite	act-epg-cht		op-qtz	epg amygs
464407	5388584	71	AE08804	hszones	icb	metaultramafite(altd)	cb		cht-wm(tlc?)-tit	pre/syn cb alt of umaf rk
464512	5389844	11	AE08805	msv	wcb	metabasite	act-epg(clz)	cht(mg)	op-cb	wcbalt
464272	5388919	71	AE08806	msv		cb-qtz rock	cb-qtz	wm(grn)-cht	ru	pre/syn cb alt / vein
464852	5389844	11	AE08807	msv	wcb	metabasite	act-epg	cht-cb	plg?	wcbalt is pre or syn metamorphic
464852	5389844	11	AE08808	msv		metabasite	cht-epg-act	tit(aft ign op)	op-qtz	tit ps aft ign op grains
465187	5389844	11	AE08809	mpo cht, agg		mafic metaclastite	plg-cht		ru-act	vfgr, cht rich
464012	5394639	71	AE08811	polygd qtz	cb?	felsic metaclastite	qtz-cb(some rusty)	wm-fp	op	no epg but wm-cb so 21 or 71
463992	5394949	11	AE08812	msv		metabasite	act(grn)-plg"	cht-epg		
464022	5395279	11	AE08813	msv		metabasite	act-epg(brn-isotropic)	hn'-plg		
463852	5395519	11	AE08815	msv		metabasite	act-epg-cht		op-hn'	
463662	5395444	11	AE08816	msv		metabasite	epg-act-cht	plg	qtz	epg almost isotropic, lots of anomalous blue
463922	5395444	11	AE08817	msv		metabasite	epg-cht-act		tit-op	
480947	5400369	21	AE08851	wpo wm		felsic metaclastite	wm-fp-qtz	cht(olgrn)	op	cb plucked, variable intensity of wm wpo
480912	5400989	21	AE08852	m-ipo wm, agg		fel mclastite/msiltstone	wm-cb-plg-qtz	cht	op	
480152	5401094	71	AE08853	msv	icb	metacbalt basite	cb-epg-plg"	cht	qtz-op-act	icbalt of plg, cb veins, amygs tooAI05932,
479432	5401019	11	AE08854	msv	mcb	intm metavolcanic rk	plg-cht	cb	tit-op-qtz	mcbalt of ?, were discrete phenos
479417	5401589	71	AE08855	w-ipo cht agg	mcb	metacbaltd intm/basite	cht-plg-qtz-cb		op-ru	defmd qtz vein present
480097	5401774	11	AE08856	msv		metabasite	plg-cht-act	tit-epg		cht olgrn, act pale grn
478567	5401789	21	AE08857	mpo cht, agg	m-icb	mafic metaclastite	cht-cb-wm-qtz-plg		op	pre/ayn metam cb-cht intergrowth
478567	5402599	21	AE08858	wpo wm,agg		chloritic metatuff	wm-qtz-plg-cht-cb		op	sub epg here, cb veins
477702	5401344	21	AE08859	msv		metafelsite	fp-qtz-cb	cht	wm-op-cb	cb as rhombs and irregular grains, plucked
477032	5400989	71	AE08860	msv	icb	metacbaltd metavolc rk	cb-wm?-cht	plg-qtz	op	icbalt, vfgr ID uncertain

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
477012	5401789	71	AE08861	msv mostly	mcb	metacbaltd basite	cht-cb(euhedral)	plg(microlites)-tit	stp-op-qtz	pre/syn meta cbalt, stp in cb-rich zone
477012	5402519	71	AE08862	msv	mcb	metacbaltd basite	plg-cht-cb-op			
476232	5401669	41	AE08863	wpo wm	cbwm	metasiltstone	wm-plg-cht-qtz-cb	tit		wmcbaltd mclste or cb is primary?
475267	5402684	11	AE08864	msv	cb	metabasite/maltd basite	act-epg-cht/cbchtepg	tit/tit?	op	cb amygs in metabasite zone
475092	5402674	11	AE08865	msv-mpo agg		metabasite	epg-act-cht-plg"		qtz-op-act	most plg replaced by epg-cht, act plgrn
474697	5402674	11	AE08866	msv, cb vn		metabasite	plg"-act-epg-cht	tit	qtz-op	plg to epg-cht, cb vn polygonized
473637	5402674	11	AE08867	mpo locally	mcb	metabasite	plg-act-epg-cht	cb	op-tit	plg microlites, w-mcbalt, cb not late phase
473642	5402979	11	AE08868	msv		metabasite	act-plg	cht-op-tit	epg	
473357	5402669	11	AE08869	msv w/ hsz		metabasite	act	plg-cht-epg	op-tit	in hsz ipo, agg, act defines ipo in part
472887	5401419	11	AE08870	msv		metabasite	act-epg-cht	tit	op	fgr
472592	5401419	11	AE08871	msv w/ hsz	mcb	metacbaltd basite	act-epg-cht-cb-plg	qtz		locally mcbalt, cb vein, act in hsz
472177	5400564	11	AE08872	msv w/ hsz		metabasite/intm	cht-plg			no act, localized hsz/ipo cht agg
471872	5400564	71	AE08873	msv		mafic metaclastite	plg-cht-cb(euhedral)			no act, could be 71
471572	5400564	11	AE08874	msv		metabasite/intm	plg-cht		epg-op-qtz	no act
473177	5398824	11	AE08875	msv		metabasite	plg	cht	epg-qtz	no act
472782	5398514	11	AE08876	msv	iwm	metabasite	cht-plg"-wm(aft plg)	tit-qtz-cb	op	iwmalt of plg, no act
472537	5399074	11	AE08877	msv		metabasite	plg-act-cht	epg-tit		
472187	5399079	10	AE08878	msv		diabase	plg'-cpxr	cht		qtz-epg vein
471787	5399109	21	AE08880	mpo wm, agg	mwm	felsic metaclastite	plg-qtz-wm	cht	tit-op-ap	mwmalt, pre/syn metamorphic, ts too thick
471382	5399109	11	AE08881	msv	icb	mcbaltd felsite/intm	plg-egp-tit?-cht		cb-op-qtz	no act icbalt is pre/syn metamorphic
474497	5400069	71	AE08883	msv	icb	mcbaltd felsite/intm	cb-qtz-plg	wm-cht	op	icbalt is pre or syn metamorphic
474217	5400069	21	AE08884	mpo agg, vn	mcb	metabasite + un rk	cht-wm-plg-qtz-op	cb	ru	mcbalt aft plg and vns, cht-wm grade, fldd vn
474217	5400069	71	AE08885	mpo agg	mcb?	metacbaltd mclastite	cb-plg-qtz-wm-cht		op	mcbalt or is cb primary?
464067	5390644	11	AE08886	sygm fibres vn		metabasite	act(clss)	plg	op-epg-cht-qtz	symoidal cht-qtz fibres in vein, almost umaf
464067	5390644	11	AE08887	msv		metabasite	act-epg-cht	tit	op	
464067	5390239	11	AE08888	msv	mwm	metabasite	act-epg(clz)	cht-plg"-wm	plg	wm aft plg
464060	5389844	71	AE08889	wpo agg		qtz mclastite/cbqtz vn	cb-qtz-cht(mg)	plg		cb is rusty
463657	5389849	31	AE08890	msv		metaultramafite	tlc-cb	se	cht-op-tit	
463267	5389849	11	AE08891	msv	wmcb	mafic metaporphyry	epg-cht-plg-cb	tit?	op	plg partly replaced by cb + wm, no act
462867	5389844	11	AE08892	msv		metabasite	act	epg-cht-plg	op-tit	
464052	5389194	31	AE08893	mpo cht, agg		metaultramafite	cb-tlc-cht		op	mpo localized
463647	5388979	11	AE08894	msv		intm metavolcanic rk	plg	cht	epg-cb-wm	no act
463122	5388999	11	AE08895	mpo agg		intm metavolcanic rk	plg-qtz-cht	op	cb	no act, 71? wonder about 10
462607	5389024	11	AE08896	msv		metabasite	act	plg-epg-cht-tit	op	
464047	5388584	71	AE08897	w-mpo wm,ag	icb	mafic metaclastite	cb-cht-plg-qtz	wm	ru	icbalt pre or syn metamorphic?
464462	5388939	71	AE08898	mpo wm, agg	mcb	cb-wm-cht rk/marble	cb	wm(tlc?)	cht-ru	metacbalt or meta primary cb

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
464772	5388919	71	AE08899	mpo wm, cren	mcb	cb-wm-cht rk/marble	cb-wm	kcth	qtz	meta cbalt or meta primary cb
465192	5388904	21	AE08900	mpo wm, agg		felsic metaclastite	qtz-plg-kf?	wm-cht-grn bt?	op	not sure about grn bt, grn ms? so 21
475577	5397049	21	AE08901	msv polygd vn		metafelsite	qtz-plg-kf?	wm	cht-stp-cb	stp
475777	5397049	11	AE08902	msv-mpo cht		metabasite	plg-act-epg-cht	op		
475977	5397049	41	AE08903	mpo wm, agg		fel metaclastite/schist	wm-fp-qtz		cht-op	
476177	5397049	21	AE08904	m-ipo wm, agg		felsic metaclastite	qtz-wm	cht		rusty wm, cht not bt
476277	5397049	41	AE08905	mpo agg, wm	ctd	fel metaclastite/schist	qtz-plg-wm	cht-ctd-cb(rusty)	op-ap	ctd-cht-rustycb
476377	5397049	41	AE08906	mpo wm, agg	ctd	felsic metaclastite	qtz-plg	ctd-wm	ru-cht	ctd-op-cht clast agg, photo op, ctd random
476477	5397049	21	AE08907	mpo	ctd	felsic metaclastite	qtz-plg-ctd-op	wm	cht-ru	photo op
476577	5397049	41	AE08908	mpo agg local	ctd cb	ctd-cb schist	qtz-cb-wm-op	ctd	ru-cht	icbalt pre or syn metamorphic?, primary cb?
476677	5397049	21	AE08909	msv-mpo wm	wcb	metafelsite/porphyry	fp-qtz	wm-cb(rusty)	cht	locally cb-rich, pre/syn meta nice resorbed qtz
476777	5397049	11	AE08910	msv vn		metabasite/qtz-epg vn	cht-plg-epg-tit	qtz-cb	op	no act, locally rich in cb, vn=qtz-epg-cb
476877	5397049	21	AE08911	mpo wm seam		metafelsite	qtz-fp(plg + ?)-wm		op-cht	qtz and fp phenocrysts
476977	5397049	21	AE08912	msv	mcb	fels metaclastite/felsite	fp-qtz-cb	wm-cht	op	
477077	5397049	71	AE08913	msv-wpo agg	mcb	mafic metaclastite	cht-cb-plg"	op		cb rhombs
477177	5397049	11	AE08914	msv cb-cht vn		metabasite	act-epg-cht	op-plg"-cb(vn)	tit	very green
477277	5397049	11	AE08915	msv		metabasite	act-cht	cb-epg-tit-plg	op	
477377	5397049	11	AE08916	msv defmd vn	mcb	metabasite(intm?)	cht-plg	cb	op	meta cbalt
477477	5397049	11	AE08917	msv		metabasite	cht-plg"-epg-act	op		
477577	5397049	71	AE08918	msv	cbwm	metawmcbaltd basite	cb-cht-wm	plg	op	cb wm altd basite, pre/syn meta?
477677	5397049	11	AE08919	msv		metabasite	epg-plg	cht-act	op-tit	
477777	5397049	11	AE08920	msv		metabasite	act-epg	cht	cpx'-op	
477877	5397049	11	AE08921	msv cb-cht vn		metabasite(umaf?)	act-epg-cht(mg)		op	epg ~isotropic
477977	5397049	71	AE08922	msv cb vn	icb	meta cbaltd basite	cb-cht-plg		qtz-op-ru	
477977	5397049	11	AE08923	msv		plg metaporphyry	plg	epg-cht	op-qtz-wm-cb	no act, but 11 is best guess
478077	5397049	11	AE08924	msv stp-cht vn		metabasite(lampro)	cht-stp-plg"	tit-cb		no act, stp-cht vn
478177	5397049	11	AE08925	msv		metabasite	am(blgrn)-stp-plg	cht-epg-tit	op	blgrn act
478277	5397049	11	AE08926	msv cb-epg vn		metabasite	2am-plg(messy)-stp	epg-cht	op-tit	2 am?, but lots of cht, epg so not 12
478377	5397049	71	AE08927	msv	icb	metacbalted basite	cht-cb-epg	tit-op-plg"		locally 11 without act,
478477	5397049	71	AE08928	mpo cht, agg		metacbaltd basite	cb-cht-tit		qtz-plg	cb part of fln, icbalt of maf rx, pre/syn meta
478577	5397049	71	AE08929	wpo cht, agg	icb	metacbaltd basite	cht-cb	op	wm-epg	icbalt pre/syn meta
478677	5397049	11	AE08930	msv-mpo am		metabasite	am-plg	cht-stp	op	am a bit dark but ts is thick, stp makes it lgz
478777	5397049	11	AE08931	msv		metabasite	plg-act	cht-epg-op	qtz	
478877	5397049	11	AE08932	msv hsz	wcb	metabasite	act-tit?-epg	cht-cb	op-qtz	wcbalt locally, qtz-epg with hsz
478977	5397049	11	AE08933	msv		metabasite/intm mvolc	act-cht	plg"	tit?-op	
479077	5397049	11	AE08934	msv		maf metahyaloclastite	cht-2epg	plg-qtz-act		no act, photo op, relict glassy textures

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
479177	5397049	11	AE08935	msv		metabasite	act-epg	cht-plg	tit-cb	
479277	5397049	11	AE08936	msv		metabasite	act-epg	cht-plg	tit-cb	
479377	5397049	11	AE08937	msv-wpo cht		metabasite/intm mvolc	epg	cht-tit		no act,
479477	5397049	11	AE08938	msv epg vn		metabasite	act-plg	epg-cht	tit	
479577	5397049	11	AE08939	msv qtz vn		metabasite	act-epg-plg	cht	tit	qtz vein is polygonized
479677	5397049	11	AE08940	msv defmd vn	wwm	metabasite	plg-cht-wm-qtz		op-tit	no act, a little uneasy with 1, defmd qtz vn
479777	5397049	11	AE08941	msv defmd vn	wcb	metabasite	epg-plg-cht-cb	un	tit	no act
476232	5400419	71	AE08942	msv mpo agg	icb	cb-metaclastite	cb-wm-cht	op-qtz		no act, icbalt pre/synmeta?, umaf?
477032	5400194	71	AE08943	msv cb-cht vn	icb	maltd mafic clastite	cb-cht-op-epg		qtz	likely maf rk,ex phenos=augen, cb pre/syn met
477832	5400189	71	AE08944	wpl agg cb vn		cb-cht metaclastite	plg-cb-cht	tit?-epg	op	nb cht-rich clast/frag, cb vn
478587	5400199	11	AE08945	msv	mcb	intm metavolcanic rk	plg-cht	cb-epg-tit	op	no act, mcbalt pre/syn meta?
478572	5400979	71	AE08946	msv polygd vn		cb-rich metaclastite?	cb-wm-qtz	cht-plg?	op	polygd qtz vn
479382	5400274	71	AE08947	msv hsz vn	icbwm	mcbwmaltd volc rk	cb-wm	gra	ru-cht?-op	cb vn, gra more abundant near defm zone,
479747	5400299	71	AE08948	msv cb vns	icb	mcbwmaltd volc rk	plg-cb-wm	cht-epg		
480147	5400319	11	AE08949	msv	wcb	metabasite	plg-act-cht	cb	op-tit	
480547	5400349	21	AE08950	wpo wm	wcb	metafelsite	fp-qtz-wm	cb	op-m/z-cht	cb as irreg porphyroblasts, syn meta cb
475991	5397344	41	AG04698	ipo hsz, wm, ag	ctdwm	ctd fel mclastite/schist	ctd-wm-plg-qtz	cb-cht	op	ctd photo op, post main fabric, wmalt
476094	5397408	71	AH03419	wpo agg	mcb	intm/cbaltd metaclastite	plg-cb	op-cht	ru	mcbalt, cb euhedral + pre/syn metamorphism
476094	5397336	41	AH03423	m-ipo wm, agg	ctdwm	ctd fel mclastite/schist	qtz-fp-wm-cb	ctd	wp-zi	ctd overgrows fabric, cb blebs/euhedral
476092	5397267	41	AH03428	mpo wm, agg	cbwm	ctd felsic metaclastite	qtz-plg-wm-cb(aft plg?)		op-ru-zi-ap	do cb and ctd go together?, rsbd qtz, altd plg
476091	5397260	41	AH03429	ipo wm, agg	cbwm	ctd fel mclastite/schist	ctd-wm-plg"-cb-qtz	cht	op	cbwm ps aft plg, brkn qtz w/ cht-cbwm in gap
476088	5396429	61	AH05684A	mrtxt, bent am	wcb	alkalic metagranite	plg(-ve)-kf-qtz	2am(grn, bl)	tit-zi-ap-bt-cht-cb	am needles=62 or 61?
474490	5397655	21	AH05699	wpo agg, cb vn		cht intm/fel mclastite	plg-qtz-cht	wm	op	
476186	5397224	21	AI05932	mpo wm, agg	ctdwm	ctd felsic metaclastite	wm-qtz-fp	ctd vn, clast	op-cht-cb-zi	ctd-op-cht clast (orig altd rk?), mineral pre dep, photo
475974	5397167	41	AI05982	m-ipo wm, agg	iwm	op-wm-cht schist	cht-wm(py?)-op-qtz	plg	m/z	cb-cht P shads in op rich clasts, precursor to ctd?
476775	5396954	41	AI06630	mpo wm, cht	to?	cht-wm schist/msltst	cht-wm-plg-qtz	cb	to-op-ap	
485057	5405549	71	96JAA-0038	mpo agg, cht	wcb	mafic metaclastite	cht-plg"-cb	tit?(fuzzy)	qtz	cb aft plg
466037	5376498	21	96JAA-0039	ipo wm, agg		felsic metaclastite	qtz-fp(-ve)-wm		cht-stp-cb	stp ll and oblique to mpo
464377	5405464	11	96JAA-0048	msv cht vn		metabasite	epg-act-plg	cht	op-tit	
460467	5405209	21	96JAA-0051	mpo wm, agg		metafelsite	fp(-ve)-qtz	cht-wm	gra?-zi-cb	wm in seams and aft plg
458512	5405229	21	96JAA-0052	mpo wm, agg	wcb	felsic metaclastite	plg-qtz	cb-wm-cht	ru	cb as augen and euhedral, pre + post mpo
455997	5404339	71	96JAA-0056	msv	mcb	metaintmvolclastite	plg-cb-cht	op	qtz	alkalic?, mcbalt of plg
453467	5401639	21	96JAA-0057	mpo wm, cb	mcb	felsic metaclastite	fp(-ve)-qtz	wm-cb	cht-op	like 0052, cb augen + porphyroblasts
454747	5397309	71	96JAA-0059	msv, brx	icb	metavolcanic breccia	cb-cht-plg	op-qtz(matrix)	wm	icbalt of mafic minerals, ts too thick
444467	5396829	21	96JAA-0062	mpo wm, cren		felsic metaclastite	plg(-ve)-qtz-wm	cb	op-cht-ru-zi	
443907	5390699	12	96JAA-0065	msv		metabasite	2am-plg(messy)-stp		op-cht-epg	

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
443907	5390699	61	96JAA-0066	msv		metaanorthosite	epg-cht-plg		tit-wm aft plg	
445662	5363119	22	96JAA-0071	wpo bt, agg		intm metaclastite/volc	plg-qtz-bt-epg	wm(partly aft plg)	op-cht(ps)	epg aft plg phenos/clasts
445662	5363119	22	96JAA-0073	mpo agg, wm		metafelsite	plg-qtz-wm	cht(part aft bt)	bt'	not sure if bt is relict ign or meta, still stable
445662	5363119	12	96JAA-0074	msv		metabasite	am-plg"	wm(aft plg)	cht-m/z-op	hn to act, zoned, upper 11 possible
448787	5364204	21	96JAA-0075	msv epg-cb vn		intm metaclastite/volc	plg-qtz-wm-epg-cht		op-cb(vn)	21 with epg
448877	5363079	21	96JAA-0076	wpo agg	iwm	intm metaclastite/volc	qtz-wm-cht-plg"	cb	op-ru	iwmalt of plg, pre/syn metamorphic
448877	5363079	21	96JAA-0077	mpo wm, agg		metafelsite	fp-qtz-wm		cb	cht rare
455557	5364789	21	96JAA-0078	msv	iwm	felsic metavolc brx	wm-cht-qtz	epg	op	iwmalt of plg, pre/syn metamorphic
449017	5363339	11	96JAA-0079	wpo agg		intm metavolcanic rk	plg-act-epg-cht	wm(aft plg)	op	
453087	5357519	21	96JAA-0080	mpo wm, agg		felsic metaclastite	qtz-wm-cht-epg	plg	op-tit	epg
454850	5396588	13	96JAA-0082	msv hn vn		metabasite	epg-hn	bt-plg	op-tit-cht(vn)	epg prominent, hn vn!, cht vn inside hn bn
454850	5396588	41	96JAA-0083	ipo wm ag hsz	ctd	meta alteration?	qtz-wm	ctd-ru-cb		seams of ru wrap ctd, some cb augen
458737	5405564	21	96JAA-0087	ipo wm, agg	to wm	metaaltd felsite	qtz-fp(-ve)-wm	cb(euhd, augen)	op-to-ru	no cht, cb-wm=21, to + wmalt, premeta alt
460442	5400799	21	96JAA-0088	wpo clasts		metaclastite	qtz-plg-kf?	wm-epg-op-cb		epg but no cht
448617	5353519	21	96JAA-0089	mpo agg		felsic metaclastite	qtz-plg	wm-cht-epg	op-m/z	21 with epg, qtz-rich
448617	5353519	11	96JAA-0090	wpo agg		metabasite	act-epg	cht(mg)	op-tit-qtz	
480671	5367122	71	96JAA-0091	mpo agg		mafic metaclastite	cht-cb-qtz-plg	wm	op	rusty cht not bt, relatively cgr, cb primary?
487359	5378557	11	96JAA-0092	wpo am, agg		metabasite	epg-act-cht-qtz	op	cb	qtz-rich
466037	5376498	11	96JAA-0093	mpo cht,wm		felsic metaclastite	plg-qtz	cht-wm	cb-op-zi	
449817	5363519	22	96JAA-0094	mpo wm,bt,ag		felsic metaclastite	wm-qtz-fp	bt	op-cb	bt in mpo
476317	5366019	21	96JAA-0095	msv		intm/fels metaclastite	plg-qtz-cht-epg	tit(fuzzy)	cb-op	
476317	5366019	21	96JAA-0096	wpo agg	mwm	intm/fels metaclastite	plg-qtz-wm-cht		op-cb	mwmalt of plg
504617	5401649	71	97JAA-0002	msv	icb	metawacke	cb-plg?-cht?	wm	op-gra	icbalt pre/syn meta?, primary cb?
508837	5401939	71	97JAA-0004	msv	icb	metacbaltd mafic rk	cb-cht-plg		wm-qtz-op	more cht than 0002
508837	5401939	71	97JAA-0005	wpo wm, agg	icbwm	mcbwmaltd volc rk	wm-cb	cht	op-ru	
512317	5372919	11	97JAA-0006	msv		metabasite	epg-act-cht	plg	op	
506222	5372849	11	97JAA-0007	msv		metabasite	plg-epg	act-cht-cpx'	op-tit	
501637	5374079	71	97JAA-0010	mpo cht, agg	cb to	cht-cb schist	cht-qtz-plg-cb		to(brn)-op-tit	cb poikiloblasts w/ Si oblique to Se
497437	5369279	11	97JAA-0012	mpo agg, act		mafic schist	epg-cht-act-plg-qtz-cb		op	
495447	5374409	71	97JAA-0014	mpo agg		stp-cht-cb schist	cht-cb-qtz-plg	stp	op	does stp make it 72?, stp random, like Vedrun
513247	5365594	71	97JAA-0015	ipo wm, agg		gra metaclastite	op(gra, x)-wm-qtz-fp	cht-un		un needles radiating clusters
504852	5357499	11	97JAA-0017	msv		metabasite	act(blgrn)-epg-plg	cht	op-tit-qtz	
517527	5373739	11	97JAA-0019	msv		metabasite	plg-epg	act-cht-cpx'	op	
523072	5372379	11	97JAA-0020	msv		mafic metaporphyry	plg-act-cht-epg		op-wm(aft plg)	vfgr matrix
522992	5370344	21	97JAA-0024	msv		intm metaporphyry	plg-qtz-cb-cht	epg	to(blgrn)-ap	enough cb for 71?
519097	5366649	21	97JAA-0025	mpo agg, wm		felsic metaclastite	plg(-ve)-qtz-wm		cht-cb-ap	

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
514657	5358644	11	97JAA-0028	mpo act, agg		metabasite	act-cht-epg-plg	qtz	op-wm	
514657	5358644	22	97JAA-0029	ipo agg,wm cht		cb-cht-wm-bt schist	cht-wm-cb-qtz-fp		bt	bt just getting going or relict, hmm?
475217	5342098	11	97JAA-0030	wpo agg		metabasite/intm	act-epg-cht-plg	cb	op	
475457	5341498	32	97JAA-0031	msv		metaultramafite	2am(clss, plgrn)	cht	op-tit	
482327	5332134	11	97JAA-0033	msv		intm metaporphyry	plg-epg-cht	qtz	op-m/z	no act
480312	5323458	22	97JAA-0034	wpo agg		intm metatuff	plg-qtz-bt-act	cht	op	
476147	5305618	71	97JAA-0039	msv	iwmcb	meta-altd rock	wm-cb-plg	cht	ru	icbwmalt, pre/syn metamorphism?
493867	5305278	71	97JAA-0041	wpo agg	icb	felsic metaclastite	plg-qtz-cht-cb(eudral)	wm		icbalt pre/syn meta?
561327	5392869	11	97JAA-0061	msv-mpo cht		metabasite	act-cht-vfgr matrix	epg	op-cb	relict glass textures, could mpo be depositional
557217	5402869	71	97JAA-0063	msv	icbwm	mcbwmaltd volc rk	wm-cb-plg	cht	ru	icbwmalt, pre/syn metamorphism?
561997	5389979	71	97JAA-0065	msv	icbwm	mcbwmaltd mafic rk	plg"-cb-wm-un	op-cht		fuzzy brn epg-like un, vfgr, wm aft plg laths
553377	5388229	71	97JAA-0067	msv	icbwm	mcbwmaltd felsite	fp-qtz-wm-cb		cht-ru-op	icbwmalt, pre/syn metamorphism?
549767	5387809	11	97JAA-0068	msv		metabasite	cht-epg(brn)		op	no act, 10? metacbalt?
526417	5371229	11	97JAA-0070	ipo agg, cht		metabasite/intm	cht-plg	epg-cb-qtz	op	no act
532957	5371529	11	97JAA-0071	mpo agg		metabasite(intm)	plg-epg-act	qtz	op-wm(aft plg)	
533617	5374859	11	97JAA-0073	mpo act, ag,cht	wwm	metabasite	cht-epg	act-wm(aft plg)	op	
542992	5366249	12	97JAA-0075	msv		metabasite	2am(act, hn)-plg		op-m/z-cht-wm	wm aft plg
545612	5353659	12	97JAA-0076	msv cb-epg vn		metabasitte	2am(act, hn)-plg"	epg(aft plg)	2op-tit-wm	wm aft plg, much plg to epg
551517	5353399	71	97JAA-0077	ipo cht, agg	icb	mcbaltd basite	cht-cb-epg		op	no act, icbalt pre/synmeta?
556517	5358619	11	97JAA-0079a	msv fracts vns		metabasite	cpx'	plg"-epg-wm	cht-op-un	no act, un clss length fast, li extinct, prn? 10?
556727	5349369	11	97JAA-0080	msv cht vns		metabasite	cht-plg-epg	wm?(aft plg)	op-tit?(fuzzy)	vfgr stuff aft plg ID uncertain
591368	5370969	21	97JAA-0082	msv	mwm	meta-lithic wacke	plg-qtz-wm-cht		op-cb	mwmalt of plg, heterolithic clast population
567868	5348719	71	97JAA-0084	msv		metacbaltd basite	cb-cht		op-tit-bt'	
571598	5353799	21	97JAA-0086	msv		intm/fels metavolc rk	plg	qtz	cht-un-epg-wm	length fast un clusters, no act
580518	5348399	10	97JAA-0087	wpo agg		metabasite	epg-plg-cht-cb(vn)	un(vn)	op	un radiating cluster, length fast prn?
577648	5357049	11	97JAA-0089	msv		metabasite	plg-cht-epg-cpx'		op-tit-act	
574678	5355109	11	97JAA-0090	msv, cb vn		metabasite	epg-cht	fuzzy tit?	op	no act
586943	5366894	11	97JAA-0091	msv		metabasite	act-cht-epg	cpx'-op	tit-qtz	
591538	5359869	11	97JAA-0093	msv		metabasite	cpxr-plg"	cht-epg-wm	act-op-tit-cb	wm aft plg
585843	5352399	11	97JAA-0095	msv qtz-cb vn		metabasite/intm	epg-plg	cht-qtz	act-cb-op-tit	plg to epg-cht, trace act in cht aggs
589018	5354219	21	97JAA-0096	msv	mwm	metafelsite	plg-qtz-kf?	wm-cht	cb-op-m/z-epg	mwmalt pre/syn meta?
589018	5354219	11	97JAA-0097	msv		intm metavolcanic rk	plg-cht-qtz	epg-tit?	wm	no act, could this be 10?
589008	5354209	11	97JAA-0098	msv	mwm	metabasite/intm	plg-cht-epg(brn)	wm-cb	op-tit	no act, vfgr ID uncertain, mwmalt
557077	5357539	11	97JAA-0100	msv		metabasite	epg-cht-plg-cb	wm(aft plg?)	qtz-act	act just getting going, vfgr ID uncertain
515227	5365069	21	97JAA-0101	wpo wm	mwm	felsic metaclastite	plg-kf?-qtz-wm-cht		op-m/z	lgz I think, mwmalt of plg
593902	5375943	11	97JAA-0102	mpo variable ag		intm metatuff	cht-epg	act		lgz I think

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
590917	5371008	11	97JAA-0103	msv		metabasite	epg-am(blgrn-olgrn)	op-plg-qtz	cht-cb	
590395	5368159	21	97JAA-0104	msv		metarhyolite	fp-qtz	epg	cht-wm	21 with epg
499971	5271205	20	97JAA-0105	msv		metalithicwacke Gow?	fp-qtz-wm	cht	bt′	detrital bt is this Gowganda?
487077	5275624	21	97JAA-0106	msv		metafelsite	plg-qtz		wm-cht-cb	cht-wm-cb coexist in at least one place
479785	5284314	20	97JAA-0107			metawacke	fp-qtz	cht	wm(aft plg)-am′	very low grade, probably gowganda
492100	5312446	21	98JAA-0001	msv		felsic metatuff	wm-fp-qtz	cht-op-cb		
491936	5312215	21	98JAA-0002	wpo cht, agg	iwm	intm metavolcanic rk	cht-wm-"plg"		qtz-cb-op	iwmalt of plg, pre/syn metamorphic
491796	5312626	11	98JAA-0003	msv cb vns	cb?	metabasite	plg-epg-act-cht	qtz-cb(vns)	op	
580191	5324473	32	98JAA-0004	wpo am		metaultramafite	am(clss)	cht(mg)	tit-cb-phlogopite	clear po of am but many oblique also
580191	5324473	22	98JAA-0005	msv		felsic metatuff	plg-qtz-kf?	act-bt	op-ap-tit	bt+act=22
580078	5324388	22	98JAA-0006	msv		heterolith metatff	plg-qtz	act-bt	op-ap-tit	same as 005, lots ap
580078	5324388	22	98JAA-0011	mpo agg, bt		felsic metaclastite	fp(-ve)-qtz	bt-epg	op-cb-wm	much of fp is plg,
496660	5334154	22	98JAA-0013	mpo ag bt	wwm	felsic metaclastite	qtz-plg-wm-bt	epg	cb-op	some wmalt aft plg
473657	5325048	12	98JAA-0014	msv		metabasite	am-plg-epg	tit	op-qtz	
474364	5326407	12	98JAA-0015	msv cht seams		metabasite	2am-plg	epg	tit-cht-op	act and hn, cht seams
494112	5317918	21	98JAA-0017	msv		metafelsite	plg-qtz-wm	epg	cht	
515112	5315218	71	98JAA-0018	msv	icbwm	intm metaclastite/volc	plg-wm-cb-cht		op-ru	
496738	5333674	22	98JAA-0020	ipo wm, clasts		felsic metaclastite	qtz-fp(-ve)-wm		cht-bt	2-3 grains bt
489733	5301193	21	98JAA-0021	msv		intm metaclastite/volc	cht-wm-plg	epg-qtz	op-cb	
492575	5307451	21	98JAA-0022	wpo agg, wm		felsic metaclastite	fp-qtz(matrix, clasts)	cb(matrix, clasts?	cht	leaning to metased, cb "clasts" are porphs?
592568	5375089	71	98JAA-0024	i-mpo/hsz		cht-cb schist	cth-cb-qtz-op	wm	op	
487107	5363811	11	98JAA-0027	msv		metabasite	plg act	epg-cht	cb-op-tit	
561820	5325524	11	99JAA-0003	msv, cht-cb vn	wcb	metabasite	plg-cht	epg-act	op	wcbalt pre/syn meta, cht>>act
562369	5324979	12	99JAA-0004	msv		metabasite	act-hn-plg	epg	qtz-op-tit-wm	wm aft plg
562715	5324621	32	99JAA-0005	msv		metaultramafite	am(clss)-cht(mg)	op-wm(tlc)	tit	
563223	5324007	13	99JAA-0006	mpo hn, agg		metabasite + clsl zone	hn-cpx	plg-qtz	op-tit-wm	wm aft plg
597475	5318353	11	99JAA-0007a	msv		intm/maf metaconglom	plg-cht-act	cb(clasts?)-qtz	hn^{d}	detrital hn??, Timiskaming?
597475	5318353	11	99JAA-0007b	wpo		mafic metaclastite	plg-cht-act	qtz-cb	hn^{d}-op	detrital am, photo op
575553	5341830	21	99JAA-0009a	wpo agg, wm		intm metaclastite	plg-cht-wm-qtz	cb(rusty)	op	
493260	5337538	13	99JAA-0010	mpo hn, cht		metabasite	hn-plg-qtz	cht(late)	op-bt	hn mpo but many grains oblique, cht seams
493159	5340978	22	99JAA-0011	mpo wm,epg		intm metaclastite	plg-qtz-wm	bt(olbrn)-epg	tit-m/z	bt+epg = 22
493159	5340978	11	99JAA-0013	msv		metabasite/intm	plg-epg-act-cht	qtz	op	
507698	5336695	11	99JAA-0016	msv qtz-epg vn		intm metavolcanic rk	plg-cht-epg	qtz	tit-cb-wm	no act
495166	5343186	11	99JAA-0017	mpo am, agg		metabasite/intm	act-plg-qtz	epg	op-bt	w/ bt, am mpo
521193	5320129	21	99JAA-0018	wpo agg		mafic metaclastite	plg-qtz-cht	cb(clasts?)	wm-op-tit	
542537	5317828	11	99JAA-0032	msv		metabasite	epg-act-cht(mg)	plg		metaanorthosite?, epg aft plg

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
534901	5314512	41	99JAA-0033	ipo cht, wm		cht-wm schist	cht-wm	op-tit?-qtz		
520036	5307940	41	99JAA-0034	mpo wm, agg	iwm	metawmaltd clastite	wm-plg	cht	op	iwmalt, pre/syn metamorphic
519067	5306818	11	99JAA-0035	msv		metabasite	epg-act-cht-plg		op-tit?(fuzzy)	messy looking rock
518844	5306584	11	99JAA-0036	msv		metabasite	act-plg-qtz-cht	epg	op	
518867	5306546	32	99JAA-0037	msv		metaultramafite	tlc-am(clss)-cht(mg)	op	tit	
500579	5308842	20	99JAA-0041	msv		metawacke	plg-qtz-lithic clasts		cht^{d}-wm^{d}-op	Gowganda, vvfgr qf matrix
499549	5307910	20	99JAA-0042	msv		metawmaltd wacke	plg-qtz-wm	cb-cht	op-zi	mwmalt of plg+matrix, more wm than 004, Gowganda
503060	5306154	11	99JAA-0043	msv		mafic metaclastite	epg-cht-act	plg-qtz	op	
476500	5323712	71	99JAA-0046	mpo cht, agg	icb	metacbaltd basite	cht-cb	qtz-plg	op	icbalt mafic rock
476204	5324102	11	99JAA-0047	msv		metabasite	plg-act-cht-epg	cb	op	
476437	5324734	21	99JAA-0048	msv		mafic metawacke	plg-cht-cb-qtz-wm		op-tit	
477074	5324818	21	99JAA-0049	wp wm, agg		qtz-fp metaporphyry	wm-plg-qtz	cht-cb	op-zi-ru	
475620	5324289	21	99JAA-0050	wpo wm, agg		felsic metaclastite	plg-qtz-wm	cht	op-m/z-cb	
475856	5323641	11	99JAA-0051	msv		metabasite(gabbro)	act-epg-cht	plg-cb	op-tit-qtz	
599430	5330098	71	99JAA-0055	ipo cht, agg		cht-cb schist	cht-cb	qtz-plg	op(vvfgr no ID)	
521897	5315668	22	99JAA-0056	mpo agg		metawacke	plg-qtz-cht	bt	op-wm(aft plg)	
506917	5314018	11	99JAA-0058	msv		intm metavolcanic rk	plg	act-cht	tit?	
476317	5366159	21	99JAA-0059	mpo agg		felsic lithic metawacke	plg-qtz-cht	wm-cb	tit-op	
476317	5366159	21	99JAA-0061	mpo clasts		felsic metaclastite	plg-qtz	cb-wm-cht-epg	op	21 with epg
538882	5320052	11	99NFT-0001	msv		metabasite	act-plg-epg	cht	op	ogs rktype = trachyte
538882	5320052	11	99NFT-0002	msv		metabasite/intm alkalic	plg-hn'-act-epg(yel)		tit-ap-qtz-m/z-wm	relict ign hn rimmed by act, epg very yellow
539680	5320652	71	99NFT-0003	ipo cht,wm,agg		cht-cb schist/hsz	cht-cb-plg	qtz-wm	op	
474384	5336746	61	01JAA-002	msv		metabasite/diorite	plg'"-hn'-act	cht-wm(aft plg)	op	11 also
468167	5339853	61	01JAA-004	wpo(ign?) gsr		metatonalite	plg'"-qtz	hn'-2epg-cht	tit-op-bt'	cht aft bt, wm aft plg, 2epg, cht-epg=meta
468054	5333863	62	01JAA-006	wpo agg, gsr		meta?tonalite	plg-qtz	hn-bt	tit-epg-ap-zi	80 if mpo is late syn ign, bt ok, seams of gsr
490328	5325382	11	01JAA-027	msv		metabasite(hyaloclt)	cht-un(epg?)	qtz-cb		vvfgr, ID uncertain
484122	5329509	32	01JAA-033	msv		metaultramafite	cht-se-act	cpx'-op		
483381	5318020	21	01JAA-038	wpo clasts		intm metavolclastite	cht-wm-plg-qtz	epg	tit	
484115	5300627	21	01JAA-039	msv	cb wm	metavolcaniclastite	cht-"plg"-qtz?	wm-cb-epg	op	iwmalt of plg, mcbalt vfgr ID uncertain
481450	5291223	10	01JAA-044	msv		metabasite	cht-epg-un(prn?)	qtz		un length fast, clss, prismatic or platey
490554	5302821	21	01JAA-047	msv		felsic metaclastite	wm-fp-cht	2cb	op	40?, vfgr ID uncertain
491499	5307683	40	01JAA-048	wpo wm	iwm	metaaltd clastite	wm-cht-cb			iwmalt pre/syn meta,
491305	5307691	70	01JAA-049	wpo clasts		metawacke	cht-qtz-fp-wm?	cb (vn, matrix)		Gowganda, vvfgr qf matrix, ID difficult
497387	5308785	71	01JAA-055	msv	icb	metaclastite	cb-qtz-fp	cht-wm	op	icbalt or primary cb?
498506	5308358	40	01JAA-056	msv		metasiltstone	qtz-fp-wm-cht	cb(clasts?)		Gowganda, cb alt as well as clasts?
491021	5317872	21	01JAA-057	wpo agg, wm	cbwm	intm metaclastite	qtz-plg-wm-cht-cb			cbwm alt of plg,

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
485783	5315100	21	01JAA-061	mpo wm cren	wwm	heterolith metatff	fp-qtz-wm	cb(blebs)	op-tit-cht	wwmalt of plg
485783	5315100	31	01JAA-062	msv		metaultramafite	se-cht-tlc	op		photo op
485783	5315100	11	01JAA-063	msv		mlamprophyre/umaf	cht-op-wm(tlc?)	bt'		bt could be phlog, umaf if wm is tlc
486633	5312556	11	01JAA-065	msv		metabasite	act	epg-cht	op-cb	cht-epg amygs
488420	5305557	11	01JAA-070	msv		heterolith metabreccia	plg-act-epg-tit(clast)	cb-cht-qtz-fp(matrix)		mafic clast in cb-rich matrix
488242	5305434	11	01JAA-071	locally mpo		heterolith metatuff/brx	cht-epg/cb-cht	act-plg-cht-tit		various mineral assemblages
571561	5334360	20	01JAA-074	msv		metaclastite	fp-cht-cb-op		br^{d}	assumed to be subgreenschist zone
597449	5318274	41	01JAA-075	bdg, no po		metasiltstone/mudst	wm-qtz-plg-cht	cb	op	absence of fabric, low grade Gowganda likely
440139	5348847	11	81A0005			metabasite	cht-epg-act-cb		tit?	amygs
448859	5353888	41	81A0008	mpo wm, cht		wm meta-qtz arenite	wm-qtz	cht-ctd	cb-to	
456612	5358449	31	81A0009			metaultramafite	tlc-op-cb-se			
458599	5356896	12	81A0010			metabasite	epg-hn	cht-act	op-cb	hn-epg limited to amygs
441859	5349786	12	81A0055			metabasite	plg-epg-hn	act-cht-op-tit		cht maybe late
442721	5349499	21	81A0056			metafelsite	plg	qtz-cht-epg-tit-cb		
448748	5352997	12	81A0077			metabasite	plg-act-hn	epg-qtz-tit	op	
447696	5350503	11	81A0091			metabasite	epg-act	cht-tit-(plg)		plg altered to?
446830	5350385	11	81A0098		mcb?	metabasite	epg-plg-cb-cht			cbaltd? Or low grade?
447301	5352389	22	81A0099			metaclastite	qtz-epg-(plg)	bt-cht-op		plg altered to epg-cht?
438920	5348597	11	81A0119			metabasite/metaumaf	act	epg	tit	metaultramafite?
453763	5354340	32	81A0121			metaultramafite	cht-act-cum-op		plg-qtz-op	
453804	5354278	11	81A0122			metabasite	cht-epg-act	tit	plg-qtz	chemistry in report looks wrong
453762	5354124	11	81A0123			metabasite	plg-cht-epg-act	tit	op	
455169	5352537	12	81A0125	mpo am		metabasite	am-plg	cht-epg	op-tit	uncertain if am is hn
457618	5353044	11	81A0142	mpo am cht		metabasite/phyllite	plg-epg-act-2cht	wm2	bt	possible interpillow material, wm aft plg?
458267	5352931	13	81A0143			metabasite	hn	plg-qtz	op-tit	
456998	5356708	12	81A0145			metabasite	epg-hn-(plg)	wm2-act	op-tit	wm aft plg
453657	5354001	11	81A0162			metabasite	act-cht-epg-tit	plg-qtz	un	amygs
453758	5353891	41	81A0163		wmcb	metaclastite	wm	cht-tit-cb		high Na, K; cbwmaltd metabasite?
452239	5356606	21	81A0166			metafelsite	plg-wm-	qtz-cht-cb	op-tit-to	nb to
442157	5351064	22	81A0184	mpo	w	metaclastite	qtz-plg-bt	cum-wm2-cht2	op-to	amphibolite zone? + wm-cht alt/retro?
459659	5356857	21	81A0213			metafelsite	plg-wm-epg	cht-kf?	cb	
459772	5356888	21	81A0214			metaclastite	wm-qtz-fp	cht-epg	op	
455579	5356672	11	81A0215			metabasite	cht-epg-act	qtz-plg	op	
452671	5351662	32	81A0218			metaultramafite	act-cht	op-cb		
452547	5351712	32	81A0219			metaultramafite	am-cht	op	epg	
442739	5349222	11	81A0310	mpo gsr		metabasite	cht-epg-act	plg-tit	qtz	possibly transition zone (2002) why?

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
444229	5350704	22	81A0314			metaclastite	plg-qtz-cht		op-tit-bt?	bt relict igneous or meta
448635	5354168	12	81A0341	cht-act zones		metabasite	cht-epg-act	hn-qtz-tit-op		cb-act zones, meta cb-cht or syn meta?
440911	5349796	12	81A0346			metabasite	epg-act-hn	cht-plg	qtz-op-tit	
440911	5349796	11	81A0378			metabasite	cht-epg-act		tit-plg-qtz	
446353	5349233	12	81A0382	mpo am		metabasite	cht-epg-act-(plg)	am-tit	op	
454684	5353684	31	81A0400			metaultramafite	cht-cb-tlc	op	plg	
453312	5351967	11	81A0406	mpo am		metabasite	epg-act	cht-qtz	op-tit	
452869	5351460	32	81A0407			metaultramafite	am-cht	op		
457205	5354760	12	81A0427			metabasite	epg-hn	bt-cht-act-op	op-qtz-plg	act-cht amygs, nb bt
486221	5368511	31	BH87-009			metaultramafite	se	op	cb	
486352	5367219	21	BH87-047			qf metaclastite	qtz-plg-cht	wm-cb-ru		nb lots ru with cht-cb could be 71
485948	5366633	21	BH87-072			qf metaclastite	qtz-plg-kf?-cht	epg	wm-tit-cb	
484961	5367311	71	BH87-103	ipo cht, aggs		phyllite HSZ	qtz-plg-wm-cht-cb		epg	
486834	5367486	41	BH87-116	ipo cht, wm		schist	wm-plg-qtz	cht-cb		hsz also? Less cb than 103
487667	5367444	21	BH87-157			qf metaclastite	qtz-plg-wm-cb	cht		
487802	5367503	31	BH87-169			metaultramafite	se	tlc-cb	op	
484664	5366785	21	BH87-247			metaclastite	qtz-plg-wm-cht		op-to-ru	
486258	5368074	21	BH87-284a	mpo cren		qf metaclastite	qtz-wm	plg-cht-cb	ru	
486258	5368074	21	BH87-284b	mpo cren		qtz-wm mclastite/phyl	qtz-wm-cb	cht	to-ru	nb to-ru and signif cb, 71?
485625	5367948	41	DP87-006a			meta-qtz arenite	qtz-wm-cht-ctd	cb-to	ap	nb lots of to, ctd, meta-alteration probably
485625	5367948	41	DP87-006b	mpo		phyllite	qtz-wm-ctd	plg?-ru		
485674	5368154	71	DP87-008		m cb?	siliceous marble	cb	qtz-cht		primary cb, pre-meta alt?
485990	5368183	41	DP87-010	mpo cren hsz?		psammitic phyllite	wm-qtz-cb	plg-cht		
485779	5368333	22	DP87-019	mpo gsr		fel metaclastite	qtz-plg-wm-cht-kf?		bt-op	
485799	5368373	31	DP87-020	cb-se vein		metaultramafite	cb-se	tlc-op		
485827	5368216	31	DP87-021			metaultramafite	op-se		cb	
485803	5368522	21	DP87-022			cb-rich metaclastite	wm-cht-cb	qtz	un	enough cb for 71?
485799	5368631	41	DP87-024	mpo		phyllite	cht-plg-qtz	wm-op-cb		metasedimentary rk
485838	5368761	21	DP87-025			cb-rich metaclastite	cb-wm	plg-cht	op	if wm is ms, 21; if wm is tlc, 31
485247	5368891	21	DP87-026			cb-rich metaclastite	qtz-wm-plg(-ve)-cb		op-tit-ru	
485970	5367776	41	DP87-029	mpo		phyllite	qtz-plg-wm-cht		tit-ru	
486048	5368292	21	DP87-031			metaclastite	qtz-plg(-ve)-wm	cht	tit	
486029	5368451	31	DP87-036			metaultramafite	tlc-cb-se	op		
485972	5368571	51	DP87-037			meta-Fe formation	qtz-wm-cb	op-cht-ctd		nb ctd, why meta Fe fm?
486393	5368094	21	DP87-041	mpo cren		metaclastite	qtz-plg-wm-cht-cb		to	
486422	5368162	21	DP87-042	mpo		metaclastite	qtz-plg-cht-kf?-cb		ru	

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
486422	5368162	21	DP87-042b	two fln		metaclastite	qtz-wm-cht	plg	op	
486395	5368918	21	DP87-043	gsr not aneald		qf metabreccia	qtz-plg-wm-cht-kf?			
487279	5369572	22	DP87-051	mpo		fp metaporphyry	qtz-kf-plg	wm-cb	bt-op-tit-ru	
487355	5369095	11	DP87-053			metabasite	plg-cht-epg-act	tit		
487423	5369602	51	DP87-054a-1	mpo later fln		chemical metased	qtz-wm-cht-cb	op	to	2 foliations
487423	5369602	21	DP87-054a-2			metaclastite	qtz-wm-op-cb	cht	to	chem metased also?
488931	5370433	21	DP87-055			metaclastite	qtz-plg-m-cht-cb	wm	m/z-ru	
489142	5370543	71	DP87-057		m	altd metaporphyry	cht-op-cb			cht-op alt pre-meta or syn-meta?
491024	5371901	22	DP87-063			metaclastite	qtz-plg(-ve)-cht-epg	wm	bt-to	nb bt
494563	5373383	21	DP87-065	mpo		metaclastite	qtz-plg-wm-epg	cht	op-tit	good eg of epg in cb-wm-cht mclastite
487961	5369790	22	DP88-001			metaclastite	qtz-wm	plg-2cht-cb	(bt)?-op-tit	cht aft bt possible here
487884	5369631	29	DP88-003	mpo cren		metaclastite	qtz-wm		op-cb	no cht or enough cb to call grade
487578	5370267	21	DP88-011	mpo cren		metaclastite	qtz-plg-wm	cht-cb	op	
487442	5369662	21	DP88-016	mpo cren		metaclastite	plg-wm-qtz		op	
487606	5369680	21	DP88-017	mpo cren		metaclastite	wm-qtz-plg		op	cren of fln in wm-rich zones
492847	5375039	21	DP88-018	mpo		metaclastite	qtz-wm-cht-plg?		cb-ru	
492917	5375120	32	DP88-023	mpo		metaultramafite	cht-tlc	plg	cum?-tit-cb	is amount or ID of cum in question?
492917	5375120	11	DP88-021			metabasite	plg-cht-epg	cb	act?-op	
492917	5375120	11	DP88-022			metabasite	plg-cht-epg		op-cb	
492947	5374917	21	DP88-024	qtz-cb vein		metaclastite	qtz-wm	plg(-ve)	cht-zi	
481792	5367767	32	DP88-035	cb vein		metaultramafite	am	cht-op		
482295	5367200	11	DP88-039	wpo		metabasite	plg-cht-epg-act	tit		
482926	5368182	11	DP88-043			metabasite	plg-epg-act	cht	tit	
479370	5370420	21	DP88-068			metaclastite(sed)	qtz-plg-cht-cb-wm			
481524	5367818	21	DP88-070			metaclastite	qtz-plg-wm-cht	op-cb		
492947	5374917	21	DP88-100	qtz fibres on op		metaclastite	wm-cb	qtz-cht	op	n.b. Qtz fibres/Pshadows on op
481524	5367818	21	DP88-101			metacgl/metavlcl	plg-wm-cht-qtz-cb	kf?	op	
482659	5369196	21	DP88-106			metaconglomerate	wm-cb	qtz-cht	op-to-ru	enough cb for 71?
479370	5370420	21	DP88-108			metaclastite	qtz-plg-cht-cb-kf?			
482904	5370976	21	DP88-110			metaclsstite	plg-cht	qtz-wm	op-m/z-ru	
487812	5367682	21	KK87-001	mpo		qf metaclastite	qtz-plg-wm	cht-op-cb		
486882	5367808	22	KK87-016	mpo						
486854	5368171	71	KK87-019	mpo		cb-cht schist	cht-cb	qtz		
487227	5367734	21	KK87-031			metaclastite	qtz-fp-wm-cb	cht		
487381	5367782	72	KK87-040			metabasite?	plg-cht-qtz-cb	act	tit	maybe ra ID is wrong, 72 or 22 (am) correct?
487381	5367782	71	KK87-040a?	ipo hsz?		phyllite	plg-cht-cb	qtz	op	

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
487373	5367902	31	KK87-041-1			metaultramafite	tlc-cb		ru	
487373	5367902	31	KK87-041-2	mpo		metaultramafite	tlc-cb		op-ru	
487602	5367723	21	KK87-044	mpo		metaclastite	qtz-plg-cht-cb		op	could be 71?
487803	5367831	21	KK87-057	mpo		metaclastite	plg-qtz-cht-op-(cb)	wm		what pseudos cb? Weathered away?
487786	5368716	31	KK87-072			metaultramafite	se		op-cb	
488015	5368020	71	KK87-077	mpo		cht-cb schist	qtz-cht-cb-op			
488043	5367702	71	KK87-078	ipo hsz?		cht-wm schist	qtz-wm-op-(cb)	cht	ru	why is cb in brackets? Cb veins?
487457	5367862	71	KK87-082a	mpo cren		cht-cb-wm schist	qtz-wm-cht-cb		op-to	
487486	5368100	71	KK87-084	ipo folded		cht-cb schist	qtz-plg-cht-cb		op	folded foliation
488147	5367433	59	KK87-089			metaFefm/su mineraliz	su	qtz		metaFefm or metamineralization
488685	5367671	61	KK87-090			metagranodiorite	qtz-plg-kf	bt'	wm-cht-epg-tit-m/z	wm-cht-epg = metamorphic, some cht aft bt
488581	5367870	71	KK87-092	ipo hsz		cb-cht phyllite	cht-cb-qtz-plg		op	
488629	5367949	61	KK87-093			metatonalite	plg-qtz-cht	cb-stp	op-m/z	NB stp in metagrtd, cb grains often euhedral
489068	5366944	22	KK87-119			qf metaporphyry	plg-qtz-wm	kf-bt		bt definitely metamorphic
488924	5367053	21	KK87-122	mpo		metaclastite	plg(-ve)-wm-qtz	cht-cb-kf?	tit	rounded clasts
491075	5372250	12	KK87-159	mpo		metabasite/intm	cht-epg-qtz-cb	am-act?-tit	bt	
484201	5367343	41	KK87-175	mpo hsz		phyllite	qtz-plg-wm-cht	cb	ru	
484660	5369022	41	KK87-177	mpo, 2nd fln		phyllite/psammite	plg-wm-qtz-cht		epg?	
484660	5369022	31	KK87-178c	mpo		metaultramafite	plg-tlc-cht-cb	qtz	op-ru	71?
484660	5369022	71	KK87-178e	mpo		cb-cht-wm schist	cht-wm-cb-qtz		ru	metaultramafite?
475759	5373557	31	KK88-010			metaultramafite/mbas	am	cht	wm-tit	
487158	5370785	71	KK88-021	mpo		cht-cb phyllite	cht-cb	qtz-plg		wondering if it could be metaultramafite
477829	5370446	71	KK88-033	mpo		cb-cht phyllite	plg-cht-qtz-cb			
479648	5367745	21	KK88-036			metaclastite	qtz-cht-wm-cb	plg	op-to-ru	
479010	5369010	22	KK88-136			metaclastite	qtz-plg-wm-cht	cb	bt?-op	NB bt is uncertain here
480126	5368847	21	KK88-151			metaclastite	qtz-plg-wm	cht-cb		
480036	5369633	21	KK88-204			intmed meta-ign rk	plg-cht	qtz-cb	op-tit-to	
476890	5369307	21	KK88-205			metaclastite	wm-cb	qtz-cht		
481732	5368266	21	KK88-218			metaclastite	qtz-plg-wm-cht	cb	stp	stp is not 22, in 2002 it was T?, ie., 22?
482444	5368800	22	KK88-223			metaclastite	qtz-plg-wm-cht		bt?-cb-stp	NB bt is uncertain here
507397	5376933	21	93TLM-0103	mpo wm, cht		felsic metaclastite	qtz-plg-wm	cht	op-to	
508807	5377116	11	93TLM-0104a	msv		metabasite	cpx'-act-cht-epg	tit		
508807	5377116	11	93TLM-0104b	msv	iwm	metabasite	cpx'-act-cht-epg-wm			wmalt after plg
508807	5377116	32	93TLM-0104c	mpo		metaultramafite	tlc-cht-act			moderate dfmd, mpo not penetrative
508807	5377116	11	93TLM-0104d	msv		metabasite				
508807	5377116	11	93TLM-0104e	msv		metabasite				

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
508807	5377116	21	93TLM-0104h	msv		felsic metaclastite	qtz-fp-cht	wm (in plg)		
512937	5382880	21	93TLM-1101a	msv		felsic metaclastite	qtz-plg-wm-cht	cb		
512934	5382793	11	93TLM-1102a	msv		metabasite	act-epg-cht-cpx'	tit		
512385	5383161	21	93TLM-1104a	mpo		metawacke	qtz-plg-wm	cht-cb		
512385	5383161	41	93TLM-1104b	mpo cren		phyllite	wm-cht-qtz-plg			
513798	5389405	32	93TLM-5201a	msv		metaultramafite	cpxr-op-cht-se-am			am is clss
513798	5389405	11	93TLM-5201b	msv		metabasite	act-cht-epg-plg			
513752	5389354	11	93TLM-5202a			metabasite	act-plg-cht-un	cpx'		un has grey biref, subgz mineral?
513752	5389354	11	93TLM-5202c	vn pren? ln		metabasite	act-cht			length fast "mica" in vn, prehnite?
513764	5389140	11	93TLM-5203b	msv		metadiabase	plg	cpx'-hn'-cht-am		relict minerals are igneous
513820	5389016	11	93TLM-5204			metabasite(diabase)	cpx'-plg)	act-cht-wm-epg		
513707	5388260	11	93TLM-5205a			metadiabase	cpx'-plg(unhealthy)	cht-act-epg?		or is epg pumpelleyite?, -ve "wm"
512828	5387375	31	93TLM-5302			metaultramafite	cpx'	se (aft ?)		assume cpx is ign, only se is metamorphic
512770	5387285	31	93TLM-5303c			metaultramafite	cpx'	cht-iun		un = isotropic red mineral, cpxenite
512725	5387194	31	93TLM-5304b			metaultramafite	cpx'		cht	cpxnite, cht aft ?
512725	5387194	11	93TLM-5304d			metabasite	cpx'-plg'	cht-bt-act		
512725	5387194	31	93TLM-5304e			metaultramafite	cpx'		cht-op	cpxesnite, cht aft ?, 30, 38?
512725	5387194	31	93TLM-5304i	mpo gsr		metaultramafite	cpx'-op	cht seams		too fine-grained to be sure of ID
512774	5387050	10	93TLM-5305			meta?diabase	plg-cpx'-am(brn)	cht		cht after cpx
512935	5387000	20	93TLM-5306a			metaconglomerate?	qtz-fp-cht		wm	quite mafic with abundant cht
511712	5386558	20	93TLM-5311a			felsic metaclastite				very low grade, wm not recrystallized
512634	5386719	10	93TLM-5312b			metabasite	plg	cht(very grn)	epg-tit?	could be 10, unsure
510697	5386303	10	93TLM-5401			meta?diabase	cpx'-plg'-cht			
511226	5386474	10	93TLM-5407a			metadiabase	cpx'-plg'-tit-wm		cht-am	just a trace of am, wm aft plg
511226	5386474	21	93TLM-5407b			metafelsite	fp-cht	(bt'?)	m/z	strange texture for fp, bt in bad shape,
511226	5386474	11	93TLM-5407c			metadiabase	cpx'-plg'		cht-act	could be <1, but with act go for 11
511335	5386399	21	93TLM-5408			felsic metaporphyry	fp	qtz-(bt)-cht	am-m/z	cht aft bt, bt igneous?
511712	5386558	31	93TLM-5411			metaultramafite	ol'-cpx'-se			
511687	5386508	31	93TLM-5412			metaultramafite	cpx'	plg'	cht-am	metapyroxenite
511893	5386537	31	93TLM-5413			metaultramafite	cpx'-o''	se-cht	op	
511641	5387250	21	93TLM-5418			felsic metaporphyry	fp	qtz-cht-tit?		quite a lot of cht
511452	5386650	21	93TLM-5422a			felsic metabreccia	fp-qtz-wm	cht	tit?	
509924	5395637	12	93TLM-5503			metabasite	2am-plg	cht-epg	op-tit-qtz	ign lath texture of plg
509736	5395395	12	93TLM-5504			metabasite	am-plg	op	cpx'	am is hn coloured but act texture, fgr aggreg
509895	5395146	71	93TLM-5507b			cb-cht metaclastite	cb-plg	qtz-cht	wm aft plg	possible pre-metamorphic cb
509830	5394971	12	93TLM-5509			metabasite	am-(plg)-cht-op	wm aft plg		am is hn coloured but act texture, fgr aggreg

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
510433	5386177	21	93TLM-5514a			felsic metaclastite	fp-qtz-op		wm-cht	a lot of op
510433	5386177	10	93TLM-5514b	vn prn?		metadiabase	plg	cpx'	cht	length fast "mica" in vn, prehnite?
506596	5389616	31	93TLM-5604			metaultramafite				probably 31
507572	5389204	11	93TLM-5608			metabasite	plg-cht-tit?(brn, fuzzy)	cpx'	op	no act, could be 10
506883	5389901	11	93TLM-5803c			metabasite	act-cht-plg-un	cpx'-op		un is bright greenish, pumpelleyite?
514524	5385007	11	94TLM-0109			metabasite	plg-cpx'	cht	wm?-epg	could be subgz
514528	5384715	11	94TLM-0110a			metabasite	cpx'-plg(not healthy)	cht-wm(aft plg)		11 based on wm-cht
519094	5377569	11	94TLM-0906a			metabasite	cpx'-plg	cht-act-epg		
518775	5377539	11	94TLM-0907b			metabasite	cpx'-plg	act	cht-bt	ugz with bt
518775	5377539	71	94TLM-0907c		icb	meta-cbaltdvolcanic	cb-cht-qtz-fp			
517202	5384348	32	94TLM-1201n			metaultramafite	act-cht	se	op	act>>>cht
517202	5384348	41	94TLM-1201a	mpo wm, cht		wm-cht-cb phyllite	wm	cb-cht	op	cht as auge/porphyroblasts, fln wraps augen
517202	5384348	21	94TLM-1201d	mpo wm, cht		metasiltstone	wm-qtz-cb-plg	cht		
517202	5384348	71	94TLM-1201f	mpo		metamarl	cb-qtz-wm-plg	cht(aft bt)		cht after bt for sure
517202	5384348	32	94TLM-1201h	msv		metaultramafite	act/trem-cht		op	
517571	5384880	11	94TLM-1202a			metabasite	act-(plg)-cht-un	cpx'		what is fuzzy gry biref min aft plg?
517571	5384880	11	94TLM-1203c			metabasite	epg-cht-plg			no act
517571	5384880	21	94TLM-1203z	mpo wm, cht		metasiltstone/phyllite	qtz-plg-wm-cht		cb-op	
514468	5384677	41	94TLM-1901e	ipo wm,cht		wm-cht-gra phyllite	wm-qtz-plg?	cht	op(gra)	
514189	5384703	41	94TLM-1904n	ipo wm,cht cren		wm phyllite	wm-qtz	cht	to-cb	$S_M + S_L$
519474	5376119	11	94TLM-2301			metabasite	(plg)-cpx'-cht-epg	op-tit		epg aft plg
521148	5380843	21	94TLM-2304	mpo		wm-cht metawacke	qtz-plg	wm-cht	cb	
516752	5380842	21	94TLM 2305	mpo wm, cht		wm-cht metawacke	qtz-plg-wm-cht		to	
519381	5384050	21	94TLM-2306-1	mpo wm, cht		wm-cht metawacke	qtz-plg-wm-cht		to zi	
486872	5377714	11	91BRB-001	msv		intmed metavolcs	plg-epg-cht-qtz	act-cb	tit-op	low act, high qtz
486657	5377779	11	91BRB-002	msv		metabasite	act-epg-cht	plg	tit-op	
486412	5377514	71	91BRB-005	mpo cht wm		wm-cht-cb phyllite	cb-wm-cht-qtz	plg	op	
486612	5376719	11	91BRB-006	msv	cb	metabasite	epg-act		plg-qtz-cb-op-tit	epg-cb alteration zone, pre-meta
486017	5376039	11	91BRB-008	wpo act, agg		metabasite	epg-act-cht	plg-qtz	op-tit	epg-rich patchs(amygs?), not all act ll wpo
486782	5376324	11	91BRB-010	gsr mod defm		metabasite	cht-epg-qtz	plg)	cb-tit-op	qtz-rich, no act
485907	5376499	32	91BRB-011	msv		metaultramafite	am-cb-cht		op	relict ign textures, pseudomorphs
485477	5376549	32	91BRB-012			metaultramafite	am(clss)-cht-cb	op		prismatic cb, pseudomorphs or eu xls?
486082	5379494	21	91BRB-014	m-ipo cht,wm		metaclastite/schist	wm-cht-qtz-plg-cb	epg	tit	cb lenslets define mpo also
486082	5379459	21	91BRB-015			ch-wm-cb metaclastite	plg-qtz	wm-cht-cb	ru	cb not late, metasedimentary probably
485492	5377244	72	91BRB-017			metalamprophyre	cb-bt-cht-qtz/fp?		ap-op-m/z	cannot say how much qtz vs fp(-ve to qtz)
485372	5377289	11	91BRB-021			metabasite	plg)-act-epg	cht	qtz-op-tit	epg replaces much of plg

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
486052	5380544	21	91BRB-022	mpo agg, clasts		metaconglomerate	qtz-plg-wm-cht	epg	cb-ap-tit	mclste, qtzar, porphyry, fefm? Clasts
486052	5380569	41	91BRB-023	ipo wm, cht, agg		metawacke/phyllite	qtz-wm-plg-cht	cb-epg-tit		cb not late,clasts or porphyroblasts
486672	5377564	41	91BRB-024	m-ipo cht,wm		metawacke/phyllite	cht-qtz-plg	cb	op	could be hsz with cb alt
485657	5377744	71	91BRB-026	mpo	mcb	cb-cht-wm phyllite	cb-cht	wm	qtz/plg-op	likely altd mafic rk, cbalt pre/syn-meta
486712	5377554	11	91BRB-027	msv	wcb	maltd mafic volc	plg-epg	cht-un(fuzzy tit?)-cb	op	all "plg" phenocrysts replaced by cb, no act
486837	5377584	41	91BRB-028	mpo wm agg		graphitic phyllite	qtz-cb-wm-op	cht		vfgr, is cb pre/syn meta alt or primary?
486857	5377604	11	91BRB-029	msv		metabasite	epg-act-plg	cht-qtz	cb-tit-op	NB qtz-plg intergrowths
486882	5377674	11	91BRB-030	mpo agg, cht		metabasite(intm?)	plg-cht-qtz	epg-cb-tit	op	a lot of qtz, plg-qtz intergrowths, no act
486872	5377709	32	91BRB-031	mpo agg am		metaultramafite	qm(clss)cht	cb	tlc-epg-tit-plg	tlc-cb seams but mostlyam-cht, epg unusual
486797	5377019	21	91BRB-032	bdg		metawacke/mudstone	qtz-wm-plg?-cht-op			op mostly gra,
486797	5376979	41	91BRB-033	mpo ll lyr		metawacke/mudstone	wm-qtz-cht-plg?	op(gra mostly)	tit	
486797	5377089	11	91BRB-034	zone of gsr		metabasite	plg-act-epg-cht	qtz	tit	gsr zone = no am-epg, some cht aft am
486797	5377089	32	91BRB-035	mpo cht agg		metaultramafite	am(clss)-cht		op-epg-tit	hetero txt, relict komat txt
487037	5376909	41	91BRB-036	po oblique bdg		metasiltstone/mudst	qtz-plg-wm-cht	un-op	to-tit	vfgr, mpo at high angle to bdg
487037	5376759	11	91BRB-038	msv		metabasite	plg-epg-act	cht-qtz	tit-op	classic greenstone
487747	5377859	11	91BRB-041	msv		metabasite(lamp?)	act-epg-bt	plg-tit	qtz-op-wm-mic	prominent bt, mic=microcline, pre-meta Kalt?
486762	5376219	11	91BRB-045			metabasite	act=plg	cht-wm-tit-qtz	cb-mic	kf-wm unusual, pre-meta Kalt?
485337	5389379	22	91BRB-046	mpo wm, agg		metawacke	qtz-plg-wm-bt	cht-epg	op-m/z-to-ap	many bt ll mpo but not all
485337	5389159	41	91BRB-047	mpo wm, cht		micaceous metasdst	qtz-plg-wm-cht-bt	op-epg	to-m/z	aluminous for rk assoc 4
485837	5387539	21	91BRB-048	m-ipo agg,wm	cb?	felsic metaclastite	qtz-plg-wm-cb	cht	epg-op-tit	prismatic cb pseudos aft ?, cbalt or primary?
485967	5387359	22	91BRB-050	mpo agg		felsic metaclastite	qtz-plg-epg-bt	wm-tit	op-ap-m/z	cb gone, wm less, lots of epg, higher grade?
485337	5385939	22	91BRB-051	m-wpo agg,epg		felsic metaclastite	qtz-plg-cht-epg	bt-wm-op	m/z	bt overgrow fln and include epg
490867	5380819	21	91BRB-055	mpo clasts, wm		metawacke	qtz-plg-wm-cht	cb	op-kf-to-m/z	cht also mpo, kf in clasts
485897	5385409	11	91BRB-056	intermit mpo		metabasite(gabbro)	act-epg-cht-plg-hn'	qtz-cb	tit-op	polygd plg, heterogeneous strain
485877	5385349	21	91BRB-057	m-ipo, agg, cht		mica-rich metaclastite	qtz-wm-cht	plg-cb	tit-epg-op-m/z	augen of cb with gra incl in core, rusty cht
487707	5378419	11	91BRB-058	msv		metabasite	act-cht	cb	op	komatiitic?, am has striking texture in places
485067	5376989	11	91BRB-059	msv		metabasite	act-plg-cht-epg		op-tit-qtz	lots of epg in plg
492417	5391849	21	91BRB-076	msv	wcb	felsic metaporphyry	plg-qtz	wm-cb	cht	wm-cb agg aft?, cb pseudos
492447	5391409	72	91BRB-077	msv	icb?	cht-am marble/mumaf	cb	cht-am	tit-qtz	very unusual rk, probably metaumaf (32)
492447	5391349	32	91BRB-078	msv		metaultramafite	am(cllss)-cht	cb	op	
491697	5391844	22	91BRB-080			felsic metaporphyry	plg-qtz	wm-bt-cb-cht		photo op, cb involved in making bt
491697	5391819	22	91BRB-081	mpo		metaclastite/porphyry	plg-qtz	wm	cb-bt	only bit of bt is preserved in cb pseudo
493217	5389909	22	91BRB-082	msv		felsic metaporphyry	plg-qtz	cht (some aft bt)	bt	wonder if this bt could be relict?
493242	5389909	22	91BRB-083	msv		felsic metaporphyry	plg-qtz		cht-bt-cb	small cb grains in plg, bt healthy beside cht
493267	5389909	22	91BRB-084	msv		felsic metaporphyry	plg-qtz		cht-bt-cb	ign texture well preserved
491697	5391929	22	91BRB-085	ipo wm		felsic metaporphyry	plg-qtz-wm	cht-bt		a lot of wm but bt OK,

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
496662	5385629	21	93BRB-001	mpo cht wm		felsic metaclastite	qtz-plg	wm-cht	cb-op	sandy, up to 2 mm clasts
496662	5385609	21	93BRB-002	w-mpo cht, agg		felsic metaclastite	qtz-plg-wm-cb(poiks)	cht	op-to(in clast)	to in clast, qtz and cb vns rexlized
496662	5385729	41	93BRB-003	mpo wm, agg		wm-cht phyllite	wm-qtz-plg-cb(poiks)	cht-ru	to-op	photo op cb poiks
496662	5385569	21	93BRB-005	mpo wm clasts		metaclastite	plg-qtz-wm-cht-cb	kf	to-op-ru	cb poiks
496662	5385549	21	93BRB-006	wpo wm		metaclastite	plg-qtz-kf-wm	cht-cb		
496662	5385529	21	93BRB-007	mpo wm clasts		felsic metaclastite	qtz-plg-wm	cht	ru	cht mostly as lge individ grains
496662	5385509	41	93BRB-008	ipo Pshads		knotted phyllite	wm-cht-qtz-fp-cb		op-ru	cb-cht-qtz knots bend mpo, cb w/ cht rims
496662	5385489	41	93BRB-009	mpo wm cren	cb?	phyllite	wm-qtz	cht-plg-cb	ru-to-op-m/z	bdg, mpo cren, Pshads, primary cb?
496662	5385469	41	93BRB-010	mpo wm su vn	cb?	phyllite metased	wm-qtz-cb	cht	op-ru-to	mpo wraps cb grains, qtz-ab-su vn
496662	5385449	21	93BRB-011	mpo	cb?	felsic metaclastite	plg-qtz-wm	cht-cb(clasts)	ru-to-op-m/z	cb clasts and porphyroblasts
496662	5385429	21	93BRB-012	mpo wm, clasts	cb?	felsic metaclastite	olg-qtz-cht-wm	cb	tit	
496737	5385399	21	93BRB-013	w-mpo dfmd vn		metaclastite vfgr	wm-qtz-plg-cb	cht?	ru-op	vfgr mineral ID ifffy 21 or 41
496737	5385499	41	93BRB-014	mpo cren bdg		metased w/ cb poiks	wm-qtz-cb	cht	op-to-ru	nb cb poiks give knotted look to rk, synmeta cb
496737	5385359	41	93BRB-017	mpo wm clasts	cb?	heterolith mconglom	plg-qtz-wm	cht-cb(Pshad)	op	cb as grains and as Pshadows, phyll clast
496787	5385744	21	93BRB-018	mpo wm agg	cb?	metaclastite	qtz-plg-wm-cht	cb	ru	
496847	5385659	21	93BRB-020	mpo	cb?	metaclastite	plg-qtz-cht-wm	epg-cb	op-tit-m/z	
497337	5385439	21	93BRB-021	mpo wm cht ag	cb?	felsic metaclastite	plg-qtz-cht-wm-cb	epg	op-tit-ru-to	metasedimentary rk probably
497337	5385539	22	93BRB-022		cb?	intm metaclastite	plg-qtz-cht-wm-epg	cb	bt-op-tit	
497337	5385399	21	93BRB-023	mpo wm, agg	cb?	cb-cht-wm mclastite	plg-qtz-wm-cb	cht-epg	op-tit	signif cb, all alteration? pre-syn meta
497337	5385379	21	93BRB-024	mpo wm, agg		metaclastite	plg-qtz-epg-wm	cht	op-tit	
494957	5380119	71	93BRB-039			mcbaltd felsite	cb-"qtz-fp"-wm	op		blotchy cb poiks, syn meta cb growht
496747	5377594	21	93BRB-041	wpo wm	cb?	felsic metaporphyry	plg-qtz-kf?	wm-cb	cht	wm-cb-cht ps aft ign bt
496747	5377574	11	93BRB-042	mpo	mcb	mcbaltd intm volcanic	cht-cb-epg-plg	qtz	op	
496747	5377694	11	93BRB-043	mpo bt, cht, agg		metabasite	plg-cht-bt		op	mpo wraps rounded grains, malt?
497867	5377199	21	93BRB-045	mpo wm, cht	mcb	mcbaltd metavolc rk	plg-qtz-cht-cb	op-wm	to(brn)	wmcbalt with to metaaltered rock
497867	5377179	21	93BRB-046	mpo wm, agg	cb?	felsic metatuff	wm-qtz-cb	cht-plg"-wm	ru-op	a lot of cb for felsite, metacbalt, pre/syn meta
497222	5377614	11	93BRB-048	w-mpo		metabasite	act-cht-epg		tit-plg	defm hetero,
494342	5378704	21	93BRB-051		cb?	wm-cht-cb mclastite	plg-qtz-wm-cht-cb		op-tit	
495392	5377219	11	93BRB-055	msv		metabasite	plg-cht-act-epg	un-un	tit-m/z	un low bir, no clv, interal zoning
495392	5377144	11	93BRB-056	mpo hetero		metabasite	plg-cht-act-epg	tit	op	
495697	5377819	71	93BRB-057	mpo		metaltd rock	un	cb-qtz-cht(mg)	ru	metaalt because qtz + mg cht
498737	5384169	11	93BRB-058	msv		metalamp/metalt?	bt>>am		cht(mg)-plg	uncertain about this one
498737	5384149	22	93BRB-059	mpo		metafelsite	fp-qtz-stp		ap-op-ru	stp random orient wrt mpo, 22 kuncertain
498737	5384129	22	93BRB-060	wpo		cht-bt metaclastite	plg-qtz-cht		bt-cb-wm	wm inside plg, bt just getting going
498737	5384109	22	93BRB-061		icb	mcbaltd felsite	cb-plg-bt-cht	op	m/z-ap	no qtz? in felsite?
497867	5377159	22	93BRB-062			intm metavolc rk	plg-bt-cht	qtz	op	metalamp possibly.

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
496662	5385409	41	93BRB-063	mpo wm cht	cb?	knotted cb phyllite	wm-cht-cb		op	mpo wraps cb-cht knots, cb or qtz core, 72?
496662	5385509	21	93BRB-064	wpo	cb?	wm-cht-cb mclastite	qtz-plg-wm-cht-cb		ru-op	cb poiks again pre/syn cbalt? primary cb?
496847	5385639	21	93BRB-066	mpo		metasandstone	plg-qtz-wm	cht-cb	tit-ru	sigif cb again, not obviously replacing stuff
495352	5378604	21	93BRB-067	mpo wm cht		heterolith mconglom	plg-qtz-wm-cb-cht	epg	op-zi	cb is clasts, clasts part of mpo
495342	5383659	21	93BRB-068	wpo		metawacke	qtz-wm-cht-cb-fp		op-ru-m/z-to	cb again
495327	5384184	32	93BRB-069	msv		metaultramafite	am-cb-se-cht	op		long blades of ol to se
495572	5384294	71	93BRB-071	msv	cb?	qtz-cb metavein/alter?	cb-qtz	wm(grn)-cht(mg)		likely metacbalt, but cannot say for sure
501437	5383394	11	93BRB-072	msv		metabasite	act-cht-epg		tit-op	
497877	5384014	21	93BRB-073	mpo	cb?	stp cb metaporphyry	qtz-plg-cht	stp-cb	op-m/z	stp not good edough for 22, prefer 21 now
497877	5383989	21	93BRB-074		cb?	wm-cht metaclastite	qtz-plg-wm cht	cb	op-ap-tit	cb again
500407	5382264	11	93BRB-075	ipo act agg hsz		metabasite	plg-act-epg cht	qtz	op	NB act in mpo/hsz
496707	5375719	21	93BRB-080		mcb	felsic metavolcanic rk	qtz-fp	qtz-wm		prismatic cb, euhedral cht agg
496717	5375729	21	93BRB-082			metawacke	qtz-plg-wm		m/z	
495867	5380859	32	93BRB-083	msv		metaultramafite	am(clss)-se-cht		op-cb	
502657	5379239	21	93BRB-085			felsic metaclastite	plg-qtz	cb(euhedral)	op-wm-cht	vfgr, NB euhedral cb again
500282	5383284	71	93BRB-090		cb?	metacbaltd rock?	cb-qtz-fp		wm-cht(mg)	rock ID uncertain, possibly metacbalteration
495277	5395894	11	93BRB-091	msv		metabasite(diabase)	plg'-cpx'-cht-epg	tit		low grade metadiabase, no act
503142	5376704	21	93BRB-093	mpo wm, clasts		wm-cht metaclastite	qtz-plg-wm-cht	kf?	cb-op	
496082	5389219	21	93BRB-094	wpo wm		metawacke	plg-qtz	wm-cht	cb-op	wm wpo in matrix
496082	5389099	11	93BRB-095			metabasite	plg-act-cht-epg	qtz	tit-op	
503407	5393024	11	93BRB-096	msv		metabasite(diabase)	plg"-cpx-cht	bt	op	lots of plg to cht-wm, cht aft cpx, bt
479477	5379299	11	94BRB-100	mpo cht wm ag		metabasite	epg-am-cht(mg)	plg"	qtz-op-wm	most of plg to epg, amyg or clast in
479487	5379314	11	94BRB-101	msv		metabasite	epg-cht-plg		act-qtz-op	
479417	5379419	11	94BRB-106	msv		metabasite	epg-act-cht-plg	qtz	op-tit	
477132	5394669	11	94BRB-107			metabasite	plg-epg-am	cht	qtz-tit-op	
477187	5394709	11	94BRB-108	msv		metabasite	act-epg-cht-un(brn)		op-tit	un = brn, fuzzy semi isotropic, lwgrade tit?
477462	5394794	11	94BRB-109			metabasite	epg-act-cht	plg?	qtz-op-tit	vfgr
476027	5395289	12	94BRB-110	msv		metabasite	am	"plg"-wm(aft plg)	op	vfgr
482397	5381744	21	94BRB-112			metawacke	plg-qtz-wm-cht		op-cb-tit	
482292	5382154	22	94BRB-113	mpo wm agg		metawacke	plg-qtz	wm-cht-bt	cht aft bt	bt as cgr books and small grains in matrix
476597	5378109	11	94BRB-115	msv	wcbwm	leuco metabasite	plg-cht	cb-wm	act-op-ap-m/z	cht ps aft mafic minerals, wm-cb localized
476247	5377974	11	94BRB-117	msv	wcb	metabasite	plg-cht	cb-act-epg	op-tit	is this enough cb to say cbalt?
476242	5377969	31	94BRB-118	mpo localized		metaultramafite	cht	tlc-cb	ru-op	
478157	5378434	11	94BRB-121	cht(mg)-cb vn		metabasite	plg-cht-epg	act	op	
481547	5384769	21	94BRB-122	wpo cht agg	mcb?	mafic mclastite(maltd?)	plg-epg-cht-qtz-cb		op	clastic txt = defm or sedm?, cht aggs as in mb
481137	5383989	11	94BRB-123	msv		metabasite	am(clss)	plg?	cb-bt-op-qtz-cht	metaumaf?

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
481547	5384769	22	94BRB-124	msv		intm metaclastite	plg-epg-cht	qtz-am(clss)-cb	op	plg-rich rk
481777	5384699	11	94BRB-125	ipo act agg hsz		metabasite	act-cht-plg-epg	qtz	op	high strain greenstone, act mpo
481837	5385169	22	94BRB-126	wpo agg		metaclastite	plg-epg-qtz-cht		wm-bt-op-cht2	cht2 aft bt
481867	5385329	32	94BRB-128	msv		metaultramafite	am(clss)-cht(mg)		bt-op	spectac relict spinifex
482292	5386019	11	94BRB-130			mafic metaclastite	epg-cht-plg	qtz	act	
481717	5382649	22	94BRB-131	mpo mica, agg		metaclastite	plg-qtz-cht-epg	bt-cb	op-tit-wm-m/z-to	NB to
480697	5382619	22	94BRB-136	mpo clast, wm		heterolit metaconglom	qtz-plg-wm-cht	bt-epg	cb-op	grade in matrix compatible w/ grade in pebs
480382	5385949	42	94BRB-138	ipo wm, agg		wm-bt phyllite	qtz-wm-un	bt		un=an-euhedral, high relief clss vvfgr epg?
480447	5385909	22	94BRB-139-1	mpo bt, wm	cb?	bt-cb metaclastite	wm-qtz-plg	bt-cb	gra	cb patches/lensesare graphitic
480447	5385909	22	94BRB-139-2	mpo clasts	cb?	bt-cb metaclastite	qtz-plg-wm	bt-cb(poiks)	zi-m/z-ap-ap	
480452	5385914	22	94BRB-141			bt-wm metawacke	qtz-plg-wm	bt-epg	cb-m/z	bt agg aft detrital bt here?
478807	5391219	11	94BRB-142			metabasite	am-plg"-epg	cht	tit	epg partly aft plg
481367	5390519	12	94BRB-143			metabasite(gabbro)	2am-epg-plg	qtz-cht-tit	bt-op	
477552	5390149	11	94BRB-144		mcb	metabasite/mcbaltd	epg-act-cht-cb		tit-op-prn	prn late aft bt, euhedral cb aft plg possib
477577	5390124	11	94BRB-145	mpo agg, am		metabasite	act-epg	cht	op-bt-cb(vns)	ugz due to bt
477587	5390099	71	94BRB-146	ipo cht, agg	icb	cht-cb metaclastite	cht-plg-qtz-cb(augen)		op	cb grain shows sinistral shear, cb pre/syn met
482147	5387269	22	94BRB-147	mpo		bt-wm metaconglom	plg-qtz-wm	bt-cht	epg-op-tit	bt overgrows mpo locally, qtzte 'pebs'!
482117	5387249	22	94BRB-148			bt-cht metawacke	qtz-plg-wm	bt-cht-epg	op-to-m/z	possible ghostly frags, volcaniclastite?
478202	5386033	22	94BRB-149		wcbwm	"bt" metawacke	qtz-plg-wm	cht-"bt"	epg-op-to	bt poiks variably attd to cht, cb-wm alt of plg
481232	5387509	21	94BRB-150		cb?	cht-cb metawacke	qtz-plg-cht-cb	wm-epg	op	good protolith for hn-bt metawacke
481447	5387709	22	94BRB-151	m-ipo	cb?	bt-cb metawacke	qtz-plg-cht-wm	bt-cb	epg-op-zi-m/z	bt overgrows fabric
481422	5387689	72	94BRB-152	msv	mcb	mcbaltd basite/clste	cht-cb-qtz-plg		bt"-op-ru-tit	bt was present now to cht, mcbaltd mafic rk
477922	5386549	71	94BRB-153	mpo cht, agg	mcb	cht-cb metaclastite	plg-cht-qtz-un	cb	tit-op	un=tiny, fuzzy brn, vfgr agg (tit?)
476777	5386014	21	94BRB-154	wpo		wm-cht metawacke	plg-qtz	wm-cht	cb-epg-op-tit-m/z	plg in good shape as well rounded grains
481122	5383524	22	94BRB-155			epg-bt metaclastite	plg-qtz-epg-bt-cht	am(clss)	op-m/z	complex texture, bt older than cht-epg-act?
481117	5385534	11	94BRB-156	mpo act		mafic metaclastite	epg-act-cht-qtz		op	act mpo, lots purple epg, lots qtz
481107	5383569	11	94BRB-157	msv epg vn		bt metabasite	act-epg-plg	cht-qtz-tit	op-bt	vein not late feature, bt = ugz
481102	5383609	52	94BRB-158			meta-Fe formation brx	am-epg-op-plg	qtz		so much op likely mFefm or metamineralization
482407	5384389	22	94BRB-159	mpo agg, cht bt		bt metaclastite	qtz-plg-cht-epg-bt		cb-op-ap-m/z	bt a little older than cht-epg possibly
478382	5387119	71	94BRB-160	mpo agg, cht	icb	cb-cht mclastite/maltd	cht-cb-op-plg	wm-qtz	"bt" grain	metaclastic txt + malt could be 71
478202	5385993	21	94BRB-161	ipo cht wm, agg	cb?	cht-wm-cb mclastite	plg-qtz-wm	cht-cb	op-ap	cb poiks + augen, not late, pre/syn metamorph
483397	5376784	11	94BRB-163	msv		metabasite	act-epg-cht	plg?	qtz-op	cht in matrix and amygs
482390	5385571	11	94BRB-164	mpo agg	wcb	metabasite	act-epg-cht-plg	qtz-cb		metaclastic text, gsr before metamorphism?
482390	5385551	42	94BRB-165			meta-Al alteration	cht-epg	bt-qtz-op	prn?	prn late phase, bt looks ok
477337	5386224	22	94BRB-166			un-bt metaclastite	qtz-plg-un	epg-bt	op-m/z	plg?poiks full of vfgr epg
478527	5392899	32	94BRB-167	msv		metaultramafite	am(clss)-cht-se?	op	cb	unsure if it is cht or se

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
478962	5392899	11	94BRB-168	msv		metabasite	act-cht	op-tit	qtz-op	
477617	5386379	22	94BRB-169			bt" metaclastite	plg-qtz	epg-cht-bt	cb-op-m/z	bt looks partly retrod, cht partly aft bt
475777	5391904	11	94BRB-170	msv		metabasite	act-plg	epg-cht-op	tit-qtz	ign texture gone
479567	5392104	21	94BRB-171			qf metaporphyry	plg-qtz	cht-wm-epg	cb-tit	cht-wm-epg aft ign bt?, some wm aft plg
479582	5392079	22	94BRB-173	mpo wm cht ag		bt qf metaporphyry	plg-qtz	wm-bt-epg-cht	tit	
479592	5392064	11	94BRB-174	ipo am, agg		metabasite	act-epg	cht-plg	qtz-op-tit	am mpo, ign texture gone
479042	5392934	11	94BRB-175	mpo am, agg		metabasite	act-epg-cht	plg	op-tit-qtz	
479062	5392919	11	94BRB-176	w-ipo, agg		metabasite	epg-cht-plg-un		am-op	un=fuzzy brn semi amorphous
480972	5390769	21	94BRB-177			wm-cht metaclastite	qtz-wm-plg	cht-cb(clasts)	op	relatively mature metased
481377	5390519	31	94BRB-178		icb	metaultramafite/basite	cht-cb-tlc	plg	qtz?-op-ru-m/z	could be 71 too
480327	5393609	32	94BRB-179	msv		metaultramafite	am-cht	se?	op	acic se/cht pseudomorphs in 'cht' matrix
482712	5395189	32	94BRB-181	msv		metaultramafite	am(clss)-se/cht		op-cb	
483062	5389704	22	94BRB-182	mpo agg, clasts		bt metaclastite	plg"-qtz	wm-bt-cht	cb-op-m/z	wm aft plg + in matrix, cb looks like clasts
480477	5378929	11	94BRB-183	mpo agg, am		metabasite	act-epg-brn un(epg?)	cht(mg)-qtz	cb-op	plg gone to am-epg etc
476908	5392511	11	94BRB-186	mpo agg, am		metabasite	acct-epg-plg-brn un	cht	cb-op	some am in mpo, cb in amygs?
475577	5395094	12	94BRB-187	msv		metabasite	2am-cht-epg	plg?	qtz-tit-op	text messy, patchy zoning of am
475577	5394979	21	94BRB-188	msv		qf metaporphyry	plg-qtz		epg-wm-cht-cb	op, ap <1,plg is -ve as phenos+matrix
475577	5394879	32	94BRB-189	msv		metaultramafite	am(clss)-cht(mg)		op	spinifex preserved metakomat
482177	5385309	11	94BRB-190	mpo cht,am,agg	mcb	bt mafic metabreccia	act-epg-cht-qtz-cb-plg		op-bt	NB bt, am mpo
482187	5385299	11	94BRB-191	mpo agg, am		metabasite	act-epg-cht	plg-qtz	op	
482212	5385289	22	94BRB-192	mpo cht, agg		heterolit metaconglom	bt-act-epg-plg-qtz-op	cht	m/z	bt overgrows, defines mpo, mumaf pebs, 32
476752	5392259	11	94BRB-193	mpo		metabasite	epg-act-cht	brn fuzzy-qtz	op-tit	
476557	5391374	32	94BRB-194	msv		metaultramafite	wm(tlc)-act(clss)	cht	op	32 but lots of tlc
483577	5394954	21	94BRB-195	mpo		wm-cht metaclastite	qtz-plg-wm	cht-epg	un-op-tit	un=fuzzy brn vfgr aggs, messy texture
483617	5394939	41	94BRB-196	m-ipo wm, agg		wm-cht-cb mclastite	wm-qtz-?plg-cht	cb	op-to	to, likely metased
480422	5394234	11	94BRB-197	msv		metabasite	act-epg	cht-tit	op-qtz	ign texture still present
481027	5394089	32	94BRB-198	msv		metalamp/basite/umaf	bt/plog-am(clss)	cht	ap-m/z	unsure about rk, if bt - mlamp, phog - mumaf
480217	5394304	71	94BRB-199	ipo hsz cht, agg		cht-cb phyllite/hsz	qtz-cht-cb-plg	op	bt/phlog(relict)	hsz/alt zone, nb relict bt
484157	5377064	11	94BRB-200	msv		metabasite	act-epg	plg-cht	cb-tit-op	
477732	5392639	11	94BRB-201	msv		metabasite	act-epg	cht-?plg?	qtz-op-cb	
477312	5393034	21	94BRB-202	m-ipo wm, clast		wm-cht metaclastite	plg-qtz-wm	cht	cb-op-zi	
480877	5394129	32	94BRB-203	msv		metaultramafite	am-cht		cb-op	spinifex txt, photo op
481707	5379949	21	94BRB-204	mpo	cb?	wm-cht-cb mclastite	qtz-plg-wm-cht	cb	op	ragged texture, cb not late, pebs of wmalt?
482397	5384789	22	94BRB-207			bt metaclastite	qtz-cht	epg-plg?-wm-bt	op	bt isolated, some retro of it, poiks?
482392	5385559	22	94BRB-208	mpo cht, agg		bt-epg metaclastite	qtz-epg-cht-?plg	bt	cb-op	
481837	5386129	22	94BRB-209	ipo bt,cht, agg		bt-epg metaclastite	qtz-pig-cht	bt-epg	wm-to-m/z	nb to

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
495957	5397639	11	95BRB-301	msv	cb?	meta?basite(diabase)	plg-cpx	cb-op		plg not healthty, cpx fine,metamorphosed?
498927	5404459	21	95BRB-302		mcb	mcbaltd qf metaporph	plg-qtz-cb	wm	cht-op	a lot of cb-wm, premeta/defm alteration
498877	5402329	11	95BRB-304			metabasite	plg-act-cht-epg			cht as euhedral ps, in matrix
498877	5402309	11	95BRB-305			meta?diabase	plg'-o"-"cpx"?	cht-epg	op	lots of plg to cht-wm, cht aft cpx, no act
497007	5397239	10	95BRB-326			meta?diabase	"plg"-cht-wm	un brn grunge-cb		very low grade, wmalt of plg
488347	5402529	21	95BRB-338		cbwm	maltd fels clastite	fp-cb-qtz-wm	cht	op	likely mcbaltd felsic rk could be 71 too
492137	5395799	32	95BRB-340	msv		metaultramafite	se-cht-am(clss)-op			relict spinifex
492137	5395899	31	95BRB-341		mcb	metabasite/intm	cht-epg-cb	qtz	op	big qtz blebs
492137	5395759	32	95BRB-342	msv	cb?	metaultramafite	se-cht-am(clss)	cb	op	
491107	5396589	31	95BRB-343		icb	mcbaltd ultramafic rk	cb-cht-tlc	plg-qtz?	op	ghost of spinifex, no am
487777	5398939	71	95BRB-344		cb?	knotted cb mclastite	cb-cht-qtz-fp	op		knots are cb agg
493367	5395559	11	95BRB-345			metabasite	act-cht-epg		tit?-op	rounded pale yellow grains tit?
493367	5395659	31	95BRB-346		cb?	metaultramafite	tlc-se-cht-cb			
485167	5395379	32	95BRB-347			metaultramafite	act-se-cht	op		
489757	5403589	21	95BRB-349		mcb	wm-cht-cb mclastite	plg-qtz-wm-cb	cht	op-ap-to	to is blgrn-gry, possibly meta alteration
491047	5396619	71	95BRB-350		icb	metacbaltd rock	cb-cht	qtz	ru-op	metaclastite, mumaf unlikely with qtz
486407	5403129	21	95BRB-351		cbwm	wm-cht-cb mclastite	qtz-plg"-wm(aft plg)	cht-cb	op	again possibly metacbaltd felsic rk
486416	5403139	10	95BRB-352			metabasite(diabase)	plgr-cpxr	op	cht-un	un=grnbrn pleo radiating aggreg (cht?)
488497	5396779	31	95BRB-353			metaultramafite	tlc-se	cb-op		
488497	5396879	32	95BRB-354			metaultramafite	am(clss)-cht		cb-op	metakomatiite
489877	5398409	32	95BRB-355			metaultramafite	am(clss)-cht/se	cb	op	spinifex metakomat, enough cb for mcbalt/
488382	5401899	21	95BRB-356	mpo plg	mcb	wm-cht-cb mclastite	plg-cb-qtz-un	cht-wm		brn agg -ve to cht, is this 10?
488362	5401999	11	95BRB-357		mcb	metabasite	cht-epg-cb	qtz-tit		no act
488342	5401859	11	95BRB-358			metabasite/intm	plg	cht-qtz	act-epg	
488322	5401839	11	95BRB-359		mcb	metabasite(cbalted)	cht-plg"-cb	op		cb aft plg pheno, very grn cht, pu?
490867	5401609	21	95BRB-361		mcb	mcbaltd qf porphyry	plg-wm-cb-cht			a lot of cb-wm, unusual rx here, cbalt
490142	5401289	21	95BRB-363	mpo variable	iwm	mwmaltd plg porphyry	plg"-wm(aft plg)	cht	op	ipo in cht zone, iwmalt of plg
490142	5401269	71	95BRB-364	fldd cb veins	mcb	mcbaltd felsite	plg-qtz-cb-cht			
490142	5401389	11	95BRB-365	hsz	wcb	metabasite(gabbro)	plgr-cpxr-tit	cht-cb-epg		high strain rexl but cpx ok
488835	5400089	31	95BRB-366			metaultramafite	tlc-cht-se			cht pleochroic pale brn to green
486907	5401829	71	95BRB-367	mpo	icb	wm-cb phyllite	wm-cb-op	ru		cannot see cht
486887	5401809	41	95BRB-368	ipo	iwm?	wm phyllite	wm	qtz-cht-cb	op	so much wm, possibly iwmalt, Pshads on op cb
487607	5403369	21	95BRB-370	mpo		wm-cb-cht mclastite	wm-cb-qtz-fp	cht		
487587	5403349	21	95BRB-371		mcb	felsic metaclastite	fp-qtz-wm	cb	cht-ru-op	cb as poiks?, not clear
488017	5403008	21	95BRB-372	mpo wm cht	mcb	wm-cb phyllite	wm-qtz-fp	cb	ru-ap-cht	tiny euhedral cb
485017	5398849	11	95BRB-373			metabasite	plg-act-cht-epg	op	stp-tit-ap-cb	

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
489007	5400879	11	95BRB-375	wpo		metabasite	cht-epg-tit	act	op	vfgr
488547	5401379	41	95BRB-377	ipo		metamineralization	wm-qtz-op	cb		asymm fibres on some op
488547	5401359	71	95BRB-378		mcb	mcbaltd basite	plg-cht-cb	qtz		no epg, act due to reaction to cht-cb
501527	5403349	21	95BRB-379	mpo wm	mwm	mwmaltd qf porphyry	plg-qtz-wm	cb-cht		wmalt, cbalt too, wm in mpo alt pre/synmeta
501527	5403329	21	95BRB-380	mpo in matrix	cb?	felsic metaconglom	plg-qtz	wm-cb	cht	msed and cb again, malt, synmeta alt?
500987	5403879	71	95BRB-382		icb	mcbaltd felsite	cb-qtz	wm-cht-un		un=brn, low biref, altd fp?
501567	5404119	21	95BRB-383	mpo wm cht	mcb	cb-wm-cht mclastite	cb-wm-cht-qtz			
502577	5403969	11	95BRB-384		mcb	mcbaltd basite	cht-cb-epg-plg	qtz-tit(fuzzy)		no act
502577	5403949	21	95BRB-386		wmcb	mcbwmaltd fels mtuff	wm-qtz-fp	cht-cb(euhedral)		pre/syn meta alteration
503697	5404439	71	95BRB-387		wmcb	mwmcbaltd felsite	wm-qtz-fp	cb-op		mwmcb alteration pre/syn meta
495817	5399219	21	95BRB-388	mpo wm cht	cb?	cht-wm-cb mclastite	qtz-fp-cht-wm-cb		ap-zi-op	
496867	5399479	11	95BRB-390		iwmcb	mcbwmaltd basite	cht-wm-cb	qtz-tit(ylbrn)		iwmalt of plg, cb too
503392	5403019	41	95BRB-392	mpo wm	mcb	metahyaloclastite	wm	qtz-fp-cht-cb		relict glass textures preserved
495617	5402899	21	95BRB-394	wpo wm	wmcb	mcbwmaltd fp porphyr	qtz-plg-wm	cb(euhedral)-cht		could be 71 too
502247	5403729	11	95BRB-395	msv but defmd		metabasite	cpx'-act-cht	plg"-wm(aft plg)		
502247	5403709	31	95BRB-396		rncb	metaultramafite	tlc-cb-cht-se-op			
486677	5398819	51	95BRB-402	stp veins	cbto	metaalteration/minerali	qtz-fp-op-cb-to-stp	gra?-stp(vn)		metaalteration(wmcbto), mineralization?
485087	5398629	71	95BRB-404		icb	mcbaltd hetero mcgl	cb-plg(-ve)-qtz-wm			cb pre/syn meta
486327	5398799	71	95BRB-405	mpo agg	mcb	mcbaltd rock	cht-cb-qtz	plg-op-stp		stp random orientation
515947	5390219	32	96BRB-415			metapyroxenite	cpxr-plg"	cht/se-am(clss)	op-tit-brn px	wm aft plgm
516359	5390582	32	96BRB-416			metapyroxenite	cpx-ol-cpx(pk) relict	cht/se-am		cht/se-am are metamorphic photo op
516359	5390782	11	96BRB-417			meta?basite(gabbro)	cpx'-plg'"-(aft plg)		cht-epg-act	wm aft plg, brn+clss cpx,
514917	5390077	11	96BRB-418			metabasite(gabbro)	cpxr-plgr"	cht	act-wm-op	meta patchy due to fluid access
514204	5389242	11	96BRB-419			intm metavolcanic rk	plg-tit-cht	epg	op	epg-cht, no act
513982	5389114	11	96BRB-420			intm metavolcanic rk	plg-tit-cht	epg	op	brnish tit again or what is it?
521157	5392166	11	96BRB-421			metabasite	plg'"-cpx'	cht-epg-wm		barely metamorphised 10?, pum?
521596	5386517	11	96BRB-423			metabasite	act-cht-plg"	cpx'	op	most plg to act
521724	5386833	21	96BRB-425	w-mpo cht, wm	cb?	wm-cb-cht mclastite	wm-qtz-plg	cb(euhedral)	cht-epg?	looking low grade
520491	5387149	11	96BRB-426	wpo		intm metavolcanic rk	plg-cht-tit?(brn, fuzzy)	epg		amygs, no act
520368	5386973	21	96BRB-427			felsic metabreccia	qtz-fp-wm-cht-epg			
519329	5386568	21	96BRB-428	wpo		felsic metavolcanic rk	qtz-fp-epg	wm-cht		wm going to make epg? not much left
519142	5386532	21	96BRB-430			metarhyolite	qtz-kf-plg		cht-tit	
519106	5386682	11	96BRB-431			metabasite	epg-plg-act-cht	cpx'	tit	
520140	5387289	11	96BRB-433			metabasite	cpx'-"plg"-un(aft plg)	cht-act-epg		un=almost isotropic,vfgr, dkgry birefringence
518680	5386490	21	96BRB-434			metarhyolite	qtz-kf	cht	epg?(brnish)	asuming kf present
518981	5385800	11	96BRB-435			metabasite	cpx'-plg	cht-act-epg	op-tit(fuzzy)	

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
520741	5390613	10	96BRB-438			metabasite	cpxr-plg	epg-cht-pu?		green epg likely pumpelleyite
523501	5389938	11	96BRB-441	w-mpo		metabasite	epg-cht-act-plg	cpx'-tit	op	
528595	5386911	21	96BRB-443	msv		felsic metavolcanic rk	plg(-ve)-kf?-qtz		epg-cht-tit	
525075	5388185	11	96BRB-444	msv	mcb	metabasite/mcbaltd	cht-cb-epg-act		op	
524872	5388801	11	96BRB-445	msv		metabasite	cpx'-act-plg	cht-epg	qtz-op-tit	
524179	5392094	11	96BRB-446	msv		metabasite	plg-cpx'	cht-act-epg	op-tit	some plg looks metamorphic
525452	5390448	11	96BRB-448	msv		metabasite	cpx'-plg	cht-epg	op-tit	
521719	5387052	21	96BRB-449	mpo	cb?	felsic metaclastite	qtz-kf-plg-cht	wm-stp-epg		
531428	5376157	11	96BRB-450	msv		metabasite	cpx'-plg''-cht-epg	op-act	qtz	plg partly to cht-epg
530277	5377650	10	96BRB-452	msv		metabasite(diabase)	cpxr-plgr	bt(w/ op)-op	act?	probably 10 if metamorphosed at all
529999	5377500	10	96BRB-453	msv		metabasite(diabase)	plg-cpx-ol(all ign)	op	bt-ap-cht2-wm2	cht-wm only evidence of meta if at all
529964	5377443	11	96BRB-454	msv		metabasite	cpx(igneous)	cht-op	act	act barely starting
528596	5379219	71	96BRB-457	mpo Pshads	icb	metamineralization	cb-qtz-wm-su	un1	un2	cb Pshads on op, un1=isotrop, gry biref
531543	5378201	11	96BRB-459			metabasite	cpx'-plg	cht-epg	op-tit-act	low grade 11, fuzzy looking, some plg is meta
542947	5382507	21	96BRB-461			metawacke	qtz-plg-cht	wm-act	op	am but no bt so 21
527271	5394879	11	96BRB-462			metabasite	cpx'	epg-cht	qtz-act-op-cb	
531300	5388651	11	96BRB-464	msv		metabasite/intm	plg	epg-cht-tit	qtz-op-wm	
518047	5393677	21	96BRB-468	mpo	mcb	metalapillituff	qtz-fp-wm-cht-cb			
521814	5385956	31	96BRB-469		mcb?	metaultramafite	tlc-cb-cht-se-op			
521814	5385969	11	96BRB-470			metabasite	cpxr-plg''-im(aft plg)	cht-act		cht-act are metamorphic,un?
521774	5385944	31	96BRB-471			metaultramafite	tlc-cht-op			
523031	5394933	11	96BRB-472			metabasite	plg-cht-tit?	epg	cb	no act
523017	5393991	21	96BRB-473	mpo wm, cht		metawacke	qtz-plg-wm	cht		
534949	5388661	21	96BRB-474	mpo	mcb	felsic metaclastite	qtz-plg(-ve)-kf?-wm	cht-cb(blebs)		cb pre/syn metamorphic
534736	5388342	21	96BRB-475	wpo	wcb	qtz-rich metawacke	qtz-plg	wm-cb-cht	ru-op	
534595	5388126	21	96BRB-476			felsic metahyloclste	fp-qtz-wm-cht	glass'	op	photo op preserved glass features
534653	5387907	21	96BRB-477	mpo cht		metabasite	plg-cht	op-tit(fuzzy)	epg-qtz	no act
536508	5389921	31	96BRB-478	mpo agg. cht		metaultramafite	tlc-cht--op			
539684	5386447	71	96BRB-480	intense defm		metamineralization	qtz-cb	su		polygd strained qtz, cb
539811	5386609	21	96BRB-482			fels metavolcclastite	fp-qtz-wm	cht	op-cb	
539824	5376430	21	96BRB-483	mpo ign?		qf metaporphyry	plg-qtz-cht	wm-epg	op	po could be ign flow feature
541789	5376517	21	96BRB-485	w-mpo cht, vn		intm fp metaporphyry	plg-qtz-cht-epg	op-act		nb stp
542456	5376375	11	96BRB-486			metabasite(diabase?)	plg(much altered)	cpx'-cht	act-op	possible act vn, if diab could it be 10?
542210	5376166	11	96BRB-487	msv		metabasite	plg''-wm-epg-cpxr	act-op-cht	hnr-qtz	hn is ign so not 2am, 11 OK
542456	5375763	11	96BRB-489	msv		metabasite	act-plg-cht	epg	op-tit-cb-op	act and cht very green
523403	5395307	11	96BRB-491	mpo		metabasite	cpx'-plg''-cht-epg	epg-tit		no act, plg mostly to cht-epg

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
523158	5386265	21	96BRB-492		mcb	qf metaporphyry	plg-qtz-kf?-wm	cht-cb		
539803	5385931	61	96BRB-494	moderate defm	mwm	metatonalite	plg-qtz	epg-cht-wm		mwmalt of plg, epg-cht-wm interpreted meta
539903	5386061	11	96BRB-495	msv		metabasite	cht-act-plg	op-tit		act is green
535643	5382997	22	96BRB-497			bt fels metaporphyry	plg-qtz	kf?-wm	cht-bt-cb-ap-op	<1% m/z, cht as ps + patches, bt rim cb
535643	5383009	21	96BRB-498	mpo agg, gsr	wcb	qf metaporphyry/tuff	qtz-plg	wm-cb	op-ap	no cht, but cb-wm ok for 21, polygd qtz vn
542157	5388931	11	96BRB-499A	msv		mafic metaclastite	plg(fuzzy)-lithic clasts	cpxr-epg-cht-cb		
542157	5388931	41	96BRB-499B	wpo wm, cht		metatuff/siltstone	wm-cht-qtz-fp		op-ru	
536557	5392449	71	96BRB-500	mpo wm, agg	icb	mcbaltd maf/umaf rk	cb-wm-cht	op	ru	op vfgr and cgr, metamineralization?
529581	5393314	71	96BRB-501	mpo wm, agg	mcb	mcbaltd felsite	plg-qtz-wm-cb		op	Pshads on cb porphs, cb pre/syn meta
529581	5393314	71	96BRB-502	mpo wm,seams	icb	mcbaltd felsite	cb-wm-qtz-fp		op	anastomosing mpo, lots qtz
527610	5387589	21	96BRB-504	mpo wm, agg	wcb	metafelsite	qtz-fp(-ve)	wm-cb	cht-tit-op-zi	cht as isolated grains
527970	5387589	21	96BRB-505	w-mpo agg		metafelsite	qtz-fp(-ve)-cht	wm	op-cb	
530402	5379395	41	96BRB-506	mpo cht		cht-ru schist/metaalt	cht	ru-fp	wm-qtz-cb-op	metamorphosed Al alteration
536894	5388166	21	96BRB-508	mpo cht, wm	cbwm	mcbwmaltd felsite	qtz-fp(-ve)-cht-wm	op-cb		iwmalt of plg, mcbalt too
536924	5388232	21	96BRB-509	mpo wm, agg		wm-cht metafelsite	qtz-fp(-ve)-wm	cht	ru-op-cb	
537787	5389463	32	96BRB-511	msv, cht vns		metaultramafite	cpx'-2cht		am-op	acic cpx still present, 2cht or is one se?
534259	5391791	71	96BRB-512	ipo wm, agg	icbwm	wm-cb phyllite/mfelsite	qtz-fp-wm-cb		cht-op	cb augen, cbalt pre/syn metamorphic
534259	5391784	21	96BRB-513	mpo wm, cht	mcb	mwmcbaltd felsite	fp-qtz-wm-cb	cht	op	cb rhombs overgrow mpo
533847	5389001	21	96BRB-516	mpo	cbwm	mcbwmaltd fel mtuff	wm-qtz-fp(-ve)-cb	cht	ru-op	cbalt>wmalt of plg
534973	5388934	32	96BRB-518	mpo agg		metaultramafite	cht-tlc	am-cb/tit	op	unsure if it is cb or tit
534973	5388934	21	96BRB-519	mpo wm, agg		fels metatuff	wm-qtz-fp		cht-op	photo op for qtz resorb, trace cht only
539734	5387235	11	96BRB-521	msv		metabasite	plg'-cpx'	cht-act-epg	op-tit(fuzzy)	
535110	5388419	21	96BRB-522	mpo agg, wm	mcb	mcbaltd felsite	wm-qtz-fp	cb(rhombs+)	cht-ru	cb aft plg + clasts, lots of ru
535110	5388411	21	96BRB-523	mpo	cbwm	mcbwmaltd felsite	qtz-fp-wm-cb	cht	ru(lots)	cbwm alt of plg, pre/syn meta
535110	5388401	21	96BRB-525	mpo wm		metafelsite/fel mwacke	qtz-fp-wm		cht-op-ru	
541070	5382166	21	96BRB-526	mpo pullaparts	mwm	fp metaporphyry	qtz-plg-wm	cht-cb	op	wmalt of plg, cht-wm-cb pullaparts in plg
536817	5393024	11	96BRB-527	msv	wwm	metabasite	cpx'-plg'	wm(aft plg)	act-cht-op	act-cht aft ?
535333	5388798	41	96BRB-528	mpo wm		wm-cb phyllite	plg-qtz-wm-cb			cb looks pre/syn meta and post meta here
525789	5388973	11	96BRB-533	msv cb-qtz vn	wcb	mcbaltd basite	epg-un-plg	cht-cb-act-qtz	op	un=brnis semi-isotropic
541084	5388059	11	96BRB-535	msv		metabasite	epg-cpxr-"plg"	qtz	cht-op	no act
535912	5383921	41	96BRB-536	mpo cht, wm	wcb?	metasiltstone	cht-wm-qtz-fp	cb-op		cb poiks cbalt is pre/syn metamorphism
525584	5309384	11	01-BRB-001	mpo cnt, agg		metabasite	cht-epg-op-plg	qtz (amyg)		
530554	5316793	62	01-BRB-002	mrtx gsr rxl		meta qtz syenite	alkfp	cht am	tit-ap-op-bt	bt in fracts partly to cht, cht aft blgrn am
548565	5327474	40	01-BRB-003	wpo compact?		metasiltstone	qtz-fp cb?	cht-wm-wm'		too fgr for mineral ID, detrital wm
550377	5323130	40	01-BRB-004	wpo pebs		metawacke	qtz-plg-kf		cht-op-wm	wm in pebs, wk alignment of lithic pebs
537898	5318152	11	01-BRB-005	mpo aggs		metabasite	act-plg	cht-qtz-op-epg	tit	cht-epg amygs to act

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
573171	5324800	62	01-BRB-006	mrtx gsr rxl		meta-alk grtd/gabbro	crs-act-plg	bt-cb	ap-tit-op-m/z	bt happy, act-crs-cb pseudos, am random orie
565256	5321208	11	01-BRB-008	msv, epg vn		metabasite	hn-plg	bt (in hn)	wm2-cht-epg-act-ap	is hn meta? = 12, if Ign? = 11, granoblast txt
562714	5324617	32	01-BRB-009	msv		metaultramafite	am(clss)-cht-bt(brn)	op		
562907	5324375	73	01-BRB-011	mpo aggs		metaclastite clsl	plg-cpx-bt-am?	epg-cb	cht2-m/z	
534143	5309116	40	01-BRB-012	wpo compact?		metasiltstone	qtz-fp		cht-tit-wm cht′	detrital cht
535793	5315903	62	01-BRB-013	mrtx brkn fp		meta-qtz syenite	alkfp	cb-qtz	bt-op	cb in fracts, gsr zones; bt+op rims, bt stable
538571	5317955	11	01-BRB-016	msv		metalamprophyre?	bt-am-"plg"	epg	tit-op	a lot of bt (pre-am) for typical metabasite
538350	5320028	11	01-BRB-017	wpo, aggs		metabasite (intm)	plg-hn′-act-epg		cht	act rims hn
538245	5320725	11	01-BRB-018	msv	wmalt	metabasite (intm)	plg-hnr-epg	act-wm	op m/z	wmalt of fp, act on hn, blgrn am twinned
563378	5323813	32	01-BRB-019	mpo, bt		meta-Na-ultramafite	cpx(aeg)-bt(very dk)	op	tit	33 if cpx is meta, alkalic rk
564062	5327921	22	01-BRB-020	msv		metatrachyte?(intm)	fp-bt-cht-cb-plg	qtz	op m/z	bt-cht-cb pseudos aft ign am
533417	5314631	62	02-BRB-023	ipo bt-am		metagranitoid	fp	cht-op	act-bt-cb-ap	defm with bt-act stable, later cht-epg
527176	5311856	22	02-BRB-028	mpo		metawacke	qtz-plg-bt(grn)	cht-epg-wm	op-tit	lithic clasts
527176	5311856	22	02-BRB-029	mpo		qf metaporphyry	plg-qtz	bt	op-ap-wm-cht-m/z	
527303	5310918	11	02-BRB-032	msv	wmalt	metabasite	act-plg(wm)	cht	tit-op	wmalt after plg
540452	5320053	11	02-BRB-033	wpo		metabasite (mlamp?)	plg-act-bt	cb-epg	op-tit-m/z	ts too thick, am aft bt as in metalamps
540440	5320340	11	02-BRB-034	mpo, am, aggs		metabasite (intm, alk?)	plg-hn′-bt′	act-epg-cht	op-tit-m/z	hn is brn, plg as matrix + phenos
536301	5321035	11	02-BRB-036	mpo, am local		metabasite	act-plg-epg-op	cht	tit-op	tit with blocky op, op = fgr + blocky, hetero rk
536890	5321273	62	02-BRB-038	msv		metadiorite	am-plg-kf?	op-ap	qtz-epg	
536890	5321273	11	02-BRB-039	msv		metabasite(intm) porph	fp-hn	epg-cht-tit	op	
542883	5318092	12	02-BRB-042			metabasite	am(blgrn,grn)-plg-epg	op-cht	tit	
542883	5318092	11	02-BRB-043	wpo, am		metabasite	act-epg-cht-op	am′(brn)		
542822	5318193	21	02-BRB-044	rexl		meta-qtz arenite	qtz	wm-wm′	cht-to-op-bt′	if Gowganda, it is higher grade, detrital bt, wm
543306	5318580	11	02-BRB-045	msv		meta-leucogabbro	plg-cht	epg-op	tit	plg to tiny grains of epg, no act
537774	5319044	11	02-BRB-047	msv		intm metatuff	epg-cht-plg		ap-m/z-qtz	cht looks like after bt, no act
538032	5320978	11	02-BRB-048	msv		hn-plg metaporphyry	plg-wm-epg-hn′-act		op-ap-qtz	hn(brn) as in metalks, wm aft plg, act aft hn
537247	5319245	11	02-BRB-050	msv, rxl qtz vn		metalamprophyre	bt-plg-am-epg	bt-epg	ap	am aft bt, meta txt, hetero txt, no cht=12?
537210	5319319	11	02-BRB-051	msv, am vn		hn metaporphyry	plg-am	bt-epg	ap	ts too thick, epg-bt aft hn?, could be 12
537360	5319891	11	02-BRB-052	msv		metalamprophyre	am-bt-plg-epg		cht-op-m/z-cb	tuffac mlamp? Messy texture, cht rare=12?
536736	5320234	11	02-BRB-053	msv, ep-act vn		metabasite amygs	act-epg		op-cht-tit	act amygs, cht rare, epg-act vn
537057	5319614	61	02-BRB-054	moderate gsr		meta-qtz syenite	afp-qtz	cht-wm	cb-op-tit	
526425	5312894	11	02-BRB-057	msv		maf lapilli metatuff	plg-act-epg-cht	qtz	op-cb	
526494	5312138	21	02-BRB-059	mpo, cht wm		metawacke	qtz-plg-kf?	cht-wm-epg/tit	op	fels lithic clasts, tiny grains lots epg or tit
526324	5312491	11	02-BRB-060	wpo, amygs		metabasite amygs	am-epg-cht-plg	op	hn′	flattening of amys synvolc?
526350	5312104	11	02-BRB-062	cht defm zone		metadiabase	plg-cht-op	wm(plg) tit?	act-hn′-qtz	gsr with cht defm zone, wm aft plg
536101	5316433	62	02-BRB-065	mortxt		meta-syenite	afp	act-qtz	tit	is am meta or ign? Probably meta after Otto

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
534735	5314739	61	02-BRB-068	m-intense gsr	cbalt?	meta-syenite	afp	cht-cb-qtz	op-wm	possible cbalt, defmd rxl qtz vn
534788	5314770	11	02-BRB-070	wpo, aggs		metabasite	epg-cht-plg	qtz-op-tit-cb		no act
534788	5314572	11	02-BRB-071	mpo	cbalt?	mafic metaclastite	cht-op-plg	cb-wm	tit/ru	mafic metased or defmd-altd basite?
531920	5311119	11	02-BRB-072	mpo, act, am vn		metabasite	am-epg-plg		op-tit	cht rare, am blgrn, am-fp vn, epg vn, 12?
529144	5312116	42	02-BRB-073	wpo ll lyr		metawacke/mudstone	plg-qtz-epg-cht	bt	op-tit-wm	wk fln parallels lyr
529144	5312116	11	02-BRB-075	msv, am vn		metalamprophyre	epg-am-bt	plg	op-w/z	am veins, "amygs"? 12? Metalamprophyre
535605	5316647	62	02-BRB-076	m gsr, bent fp		metasyenite	afp-bt	qtz-cb-bt′	cht-op-ap-m/z	photo op - 2 bt, metagrtd text
528511	5309878	21	02-BRB-077	mpo, clsts,agg	prem cb	crystal metatuff	polg-wm-epg-cht		op	pre-metawm alt?, rexl vein
527544	5309378	61	02-BRB-083	mpo agg, gsr		metatonalite	plg-qtz-epg-cht	wm	tit-op	cht aft bt,
528677	5310499	31	02-BRB-084	msv		metaultramafite	se-cht	op		photo op metaultramafite
529904	5311512	11	02-BRB-085	msv		metabasite	plg-epg-cht	qtz-op-cb		no act
526078	5316263	11	02-BRB-090	defm zn,epg vn		metabasite	plg-cht-epg-hn′	qtz-op-tit	ap	fuzzy altd look, very low grade? Pumpelleyite?
540381	5321041	71	02-BRB-095	mpo ll lyr, cren		cb-cht-wm schist	cb-cht-wm-qtz		ru-m/z-op	crenulated fln,
540383	5321307	62	02-BRB-096	w gsr		metasyenite/diorite	fp	cpxr-act-cht	op-ap	reddish alt,
540297	5321194	21	02-BRB-097	mpo		metaclastite	fp(probab plg)-epg	cht	op-un(act?)	vfgr epg, low biref; needles of un, no wm
550909	5319575	12	02-BRB-101	wpo, am		metabasite(intm)	plg-am-qtz		op	some colour variation in am, most am random
550646	5319157	22	02-BRB-103	ipo, cht-cb dz		intermed mvolc rk	plg-qtz-bt-am		cht-op	bt very fresh, blgrn-pgrn, some pale am
548748	5320382	61	02-BRB-104	strained qtz		metatonalite/tonalite	plg-qtz	am-cht-epg-kf	op-tit-m/z	cht-epg aft bt, plg to wm+epg in core.
544866	5325938	11	02-BRB-105	msv		metabasite	hn-epg-plg	wm-epg-act	op-cht-m/z	hn is ign=11; hn is meta=13+11, wm amygs!
544718	5326582	22	02-BRB-108	mpo ll lyr		Ca-rich metaclastite	plg-epg-am-qtz		wm-op-bt-m/z	am blgrn-olgrn, plg +ve to qtz, az?
537198	5317342	49	02-BRB-111	gsr qtz P shads	wmalt	meta py-qtz vn	qtz-py-wm(vfgr)			metamorphosed mineralization
531864	5309760	61	02-BRB-112	wpo, agg, mrtx		metatonalite	plg-hn-qtz-kf	wm-cht-epg	tit-act-op-ap	wm aft plg, cht aft bt, act aft hn
545213	5327277	22	02-BRB-113	ipo bt, aggs		metaclastite	act-plg-qtz-cht	wm(aft plg)	"bt"-op	plg matrix/augs, bt stable defm = act cht later
533276	5312926	61	02-BRB-121	igrs,	cb	metaclastite	fp-qtz-cb-wm-cht	op		defmd mgrtd, cb altd
544704	5326725	73	02-BRB-122		cb?	cb-rich metaclastite	hn-ep-wm	qtz		hn aggreg aft? Wm agg aft? Metaalteration?
525342	5313234	22	02-BRB-123	wpo, veins		metaclastite	qtz-wm-cb-py-cht	fp	bt (with py)	22 with 21 overprint possible
525380	5312870	11	02-BRB-124	msv, veins		metabasite	plg-cht-act-epg-op	qtz		lot of op, mineralized?, varioles?
529771	5309681	12	02-BRB-128	wpo, ep-act vn		metabasite	hn-epg	plg	act-qtz-op	act in vn/segr, txt too ragged for 13
529237	5310161	11	02-BRB-131	ipo, cht		metabasite(intm)	plg-qtz-cht-epg		op	no act
529164	5310969	72	02-BRB-132	msv		metamineralization	op-epg-cb-sphal?		act	spectac txt, sphalerite? Photo op
529164	5310969	11	02-BRB-133	msv		metabasite (diabase)	plg-cpxr-wm(aft plg)	act-cht-epg		epg with cht in aggs, inside plg
535108	5314675	21	02-BRB-136	wpo		felsic metaclastite	wm-plg-qtz-cht-op			
571061	5326759	13	03-BRB-140	w-mpo rxl		metabasite	hn	qtz-plg-epg		wm aft plg, plg +ve to qtz
571864	5326042	61	03-BRB-143	wpo aggs		maf metasyenite	kf-hn	pkg(altd)	ap-bt-cpx	hn rim on cpx, rims of op on bt (unhappy?)
571892	5325965	62	03-BRB-144	wpo		maf metasyenite	kf-plg-hn-cpx-bt	wm	tit-ap-m/z	hn rims on cpx, hn + cpx aft bt?
561939	5328182	20	03-BRB-146	msv cht vn		metawacke	plg-qtz-cht	wm	bt′	detrital bt, somewhat higher grade Gowg?

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
562664	5327858	21	03-BRB-147	wpo defm zns		felsic metaclastite	wm-cb-plg-qtz		cht(very green)	more likely volcaniclastic, unless frag dyke
561957	5328364	21	03-BRB-150	ipo		felsic metaclastite	wm-cb-plg/kf		cht-op	only trace of cht
561988	5323157	22	03-BRB-152	wpo		fel metaporphyry	fp-qtz	cb-cht-wm	bt-tit-op	rexl igneous texture
563230	5322950	62	03-BRB-154	gsr		metasyenite	afp-kf	cpxr-btr-qtz	act-tit-ap-m/z	cm zoned fp, photo op
562619	5323729	21	03-BRB-157	mpo		qf metaclastite	qtz-fp	wm-epg-cht-cb-op	grt?	graphite possibly
529164	5310969	11	03-BRB-159	msv		metabasite	act-"plg"-epg	cht	op-tit	plg not healthy
529164	5310969	11	03-BRB-160	msv		metabasite (diabase)	cp′-plg′	op	cht-act-epg-m/z	wm alt of plg, primary ign text in good shpae
563554	5326793	11	03-BRB-166	msv		metabasite	act-"plg"-cht-epg	op-qtz-cg-tit-wm		
563168	5326377	11	03-BRB-167	msv		metabasite	act	"plg"-wm-epg-cht	op	plg mosty gone to wm, epg
553642	5323309	11	03-BRB-170	msv		metabasite	cpxr-plgr	op	cht-epg-act	wm aft plg
553188	5323648	11	03-BRB-171	msv		metabasite	cht-act-epg-plg	op-tit		
552833	5323779	11	03-BRB-172	msv		metabasite	act-epg-cht-"plg"	qtz-op-bt		note bt present
558124	5323410	11	03-BRB-175	wpo am		metabasite	act-epg-cht		op	cht-epg amygs, vfgr
557779	5323979	21	03-BRB-176	ipo cht, aggs		intm metaclastite	qtz-fp-cht	cb-epg	wm-op	could be 11 also
557593	5324809	11	03-BRB-177	msv		metabasite	act-"plg"-epg-cht	qtz-op		
552859	5319109	12	03-BRB-181	mpo hn		metabasite	"plg"-hn-act-wm	epg-cht	op-tit	upper 12, am still colourzoned
554397	5317368	11	03-BRB-184	msv		alkalic metabasite	hn′-afp	act-epg	qtz-cpx′	hn(ylgrn-blgrn), act rims on hn, act aft cpx
560764	5321877	22	03-BRB-185	msv epg vn		felsic metavolcanic	qtz-fp	wm-cht	bt	hn and some bt look old (ie ign)
560814	5321844	22	03-BRB-186	mpo		felsic metaclastite	qtz-fp(-ve)	bt-cht(grn)-epg	grt -op	nb grt!, nice brown bt
561213	5322787	22	03-BRB-187	msv		felsic metaporphyry	plg-kf	qtz-bt	op-tit-cb-op	meta alkalic rk, NB acic tit, could be 62
561958	5321000	32	03-BRB-189	msv cum vn		meta-ultramafite	se-cht-cum-op	cpx′		good eg metaumaf photo op
549266	5318534	12	03-BRB-190	wpo aggs		metabasite	act(dk)-hn-plg-qtz	epg	op-tit	colour variation in am, ragged text
549507	5319003	22	03-BRB-193	msv		intm metaclastite	plg-qtz-am(act-hn)		bt	cm scale lithic clasts, a lot of am, ex Cb-rich?
549197	5318267	11	03-BRB-194	msv		metalamprophyre	am-bt-epg-wm	cht	cb-cpx′-m/z	complex txt, bt looks on way out, act-cht in
550139	5320488	13	03-BRB-195	mpo hn, bt		mafic metaclastite	hn-plg-qtz	bt-epg	op-wm(aft plg)	too much qtz + bt for true amphibolite, msed?
550027	5320652	62	03-BRB-197	m, polgd qtz		metagranodiorite	pkg-qtz	am(pbrn)-cht	act-ap-m/z	cht aft bt, act aft am
566791	5327039	32	03-BRB-198	wpo in defm zn		metaultramafite	am(clss)		op-cht	pris am bent into + growing in defm zn
566791	5327039	32	03-BRB-199	msv		metaultramafite	am(clss)		op-cht-tit	
527395	5315434	12	03-BRB-305	msv		metabasite amyg	hn-act-epg-plg		op	too fgr
567676	5322279	62	03-BRB-330	msv polygd		alkali metagranite	afp	cpx(ylgrn)-am(bl)	qtz-tit-bt	am is meta=62, if late ign=80 (lean to meta)
562257	5322279	22	03-BRB-337	mpo		felsic metaclastite	fp(-ve)-qtz	epg-bt-cb-wm	cht-hn-op	hn is pale, partly resorbed qtz, rounded fp
559933	5322845	11	03-BRB-339	msv		metabasite	act-epg-"plg"	op-cht	qtz-tit	pale blgrn am
556545	5323010	13	03-BRB-342	wpo hn		metabasite/andesite	hn-plg-qtz	op	epg? In plg, act	hn colours act texture, trace act very green
570908	5327446	13	03-BRB-405	msv gsr		intm metaclastite	am-plg-qtz-bt		tit-op	am aft bt, am blgry-grygrn
555151	5318757	61	03-BRB-408B	qtz polyd		metagranodiorite	plg-qtz-kf	hn	epg-tit-cht-ap	wm-epg aft plg, bt to cht, is cht a 2nd metam?
555033	5318040	13	03-BRB-416	ipo hn, aggs		metabasite/amphibolite	hn-plg	qtz	op-tit-epg	

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
572385	5326090	22	03-BRB-427	ipo act, aggs		qf metaclastite	fp(-ve)-qtz	epg-act	tit-cht-wm	
572923	5326084	72	03-BRB-434	mpo aggs		felsic metaclastite	plg-qtz-epg	am	tit	plg>qtz protolith likely cb-rich
572923	5326084	12	03-BRB-433	msv		metabasite	hn-act-epg-wm	pkg(altd)	tit-op	dk act grading to hn, lots of epg, wm aft plg
571374	5324742	62	03-BRB-439	mpo cpx, am		fgr alkalic metagrtd	fp-qtz	cpx′-2am	2bt-tit-op-m/z	micro, plg phenos, bt + am both ign and meta
562436	5326144	11	03-BRB-448	msv brkn cpx		metabasite	act-epg-cpx′	cht		
565397	5321391	13	03-BRB-451	msv		metabasite/bt gabbro	bt-cpx-hn-plg		tit	cpx-plg aggs look like pseudos (meta), unsure
565397	5321391	62	03-BRB-452	wpo aggs		metagabbro(bt)(mbas)	plg-act-bt-cpx′	epg-tit	op	bt happy, tit linked to meta of bt?
569613	5327606	12	03-BRB-460	msv		metabasite	am(blgrn)-epg	plg-qtz	op-tit-m/z	tit rims on op,
571917	5321211	62	03-BRB-467	polygd		metasyenite	kf-afp	cpxr-ap-op-bt		bt happy so only txt says meta,
562116	5327245	11	03-BRB-470	msv		metabasite	act-epg-plg	cht	op-tit rims	plg mostly gone to epg-cht
561780	5327133	71	03-BRB-473	msv	cb	cbaltd metabasite	cht-wm-cb	qtz	op-tit	
561600	5327032	11	03-BRB-474	msv		plg-act-cht-cb	bt′	m/z		
559583	5325759	11	03-BRB-487	msv		metalamprophyre	fp-cb-cht-bt′		tit-m/z-op-epg	no act
556936	5322037	13	03-BRB-493	ipo hn		metabasite	hn	tit-epg	qtz-op	nb epg
557036	5322365	13	03-BRB-495	msv		metabasite amphibolite	hn-plg	qtz	op	
559842	5324716	13	03-BRB-500	msv plgd qtz vn		metabasite/amphibolite	hn-epg	plg-qtz	tit-op	epg prominent hn-epg facies?
561941	5324596	22	03-BRB-509	wpo aggs		qf metaclastite	qtz-fp-wm-cht	hn-epg-bt	op-tit	mafic clasts/frags in
565619	5326337	32	03-BRB-535	msv		metaultramafite	am(grn)	epg	tit-op-qtz	am rather greener than normal
565619	5326337	32	03-BRB-536	msv		metaultramafite	am		op	relict spinifex, am rather green
565849	5326273	32	03-BRB-538	msv		metaultramafite	am (grn)		epg-op-tit	relict spinifex, am rather green
565236	5326042	11	03-BRB-541			metalamprophyre	fp-act-bt′-cpx′		cb-m/z-op-tit	
567862	5319655	62	03-BRB-547	msv		intm metaporphyry	fp-hn′-act	tit-epg		porphyritic metasyenite, hn=ign, am=meta
567712	5320420	62	03-BRB-551	annealed polyd		metasyenite	kf	cpx(aeg)-qtz	tit-am(blgry-gry)	blgry am spikes on cpx
558253	5327290	71	03-BRB-560	wpo matrix		metavolcaniclastite	fp-cb-wm	cht-op		hn all gone to cht
556477	5326917	11	03-BRB-566	mpo cb vns		metatrachyte?(intm)	pf-cht-cb	act-op		act=ex phenos? Distinctive txt, primary fln?
566596	5327250	11	03-BRB-568	msv		metabasite (diabase)	pkg-cpx′	act	op-tit(fuzzy)	pkg to wm-epg
567234	5327405	32	03-BRB-570	wpo act agg		metaultramafite	am(clss)	cht-op-tit		
567299	5327086	32	03-BRB-571	msv		metaultramafite	am(clss)	cht	op	
566784	5327714	32	03-BRB-572	msv		metaultramafite	am(clss)	cht	op-tit	
569231	5318937	62	03-BRB-575	polygd		metasyenite	kf-afp	qtz-hn	tit-op-cb-am	spikes of am on hn
569552	5318986	32	03-BRB-577	msv		metaultramafite	cpx′-hn′-act-cht	op-cb-tit		amph zone or primary ign cpx-hn, enclave
567204	5326544	11	03-BRB-600	msv		metabasite(diabase)	cpxr-plgr(wm-epg)	op-cht	hnr-epg-act-m/z	relict ign diab text, nb act clot with chtzd bt
565123	5320883	11	03-BRB-603			metabasite (alkalic)	hn-plg-kf	wm(aft plg)	op-epg-ap-tit-m/z	kf=microcline, 11 if hn is ign, 13 if hn is meta
564888	5321147	11	03-BRB-604	msv		metabasite	hn′	cpx′-"bt′"-act	epg-cht-op-tit	act aft ?, am hetero colours,
564814	5321332	13	03-BRB-605	msv		metabasite/bt gabbro	hn-plg	cpx-act-bt	op	bt ok, 11 on bt gabbro, 13 metabasite
565458	5320501	11	03-BRB-607	msv		metabasite	hn′-cpx′	bt′	act-epg-op	act-epg are meta,

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
565800	5320079	13	03-BRB-608	msv		metabasite/gabbro	hn-cpx-bt	op		lge patch granobl cpx w/ hn inclusions=meta?
565178	5320250	13	03-BRB-609	wpo		metabasite/gabbro	hn-cpx-bt	plg-kf	m/z	rims on cpx optic contin w/core, unsure
538074	5322862	12	03-BRB-610	msv		metabasite	hn-act	wm-epg-cht	op	plg gone, hn ok, am aggreg, act-epg-cht ok too
538525	5323040	11	03-BRB-612	msv		metabasite/mqtzdior	am-plg-qtz	cht-wm-epg	bt	wm-epg aft plg, cht aft bt
538609	5322670	61	03-BRB-613	msv mrtx polgyd		meta-qtz monzonite	pkg-kf-(microcl)-qtz	am (patchy grn)	epg-cht-tit-op-ap	cht aft bt, act-cht-epg is meta
537407	5325509	62	03-BRB-614	polygd qf		metagranodiorite	plg-qtz	hn	epg-act-tit	epg-act agg aft hn, tit rhombic
555080	5324808	11	03-BRB-616	msv		metabasite	act-plg-cht-epg			patchy wm-epg aft plg
555025	5324854	11	03-BRB-617	msv		metabasite	plg-cht-op-act	epg-hn′	op-tit	euhedral plg
569173	5327370	13	03-BRB-619	ipo		mafic metaclastite	plg-qtz-hn	bt-cht2-wm2		wm2 aft plg, cht aft bt, wm-cht ll ipo 13+11
544408	5324410	11	03-BRB-621	wpo		metabasite	hn′-epg-plg-act	cht	op-tit	wmalt of plg,
535909	5320836	11	03-BRB-623	msv		metabasite (diabase)	cpxr-plgr-act-cht-epg	hnr-qtz-op	bt	more metad than most metadiab
562875	5325615	71	03-BRB-626	polyd qtz		metafelsite (aplite)	plg-kf-qtz		cb(rusty)-op	no cht or wm but Fecb + qtz = 7, bent fp
563536	5325292	11	03-BRB-627	msv		metabasite	act(blgrn)-epg	cht	tit-op	epg after plg
563587	5324827	12	03-BRB-628	wpo		metalamprophyre	2?bt-plg-cpxr	epg-am-m/z	op-cb-ap	2 bt (fgr + cgr?), internal zn in cpx, am dkgrn
563587	5324827	12	03-BRB-629			metalamprophyre	plg-bt(grn)-cpx′?			13 if cpx is meta, NB bt texture
563608	5324476	20	03-BRB-631	mpo cht		metawacke (Gow)	qtz-fp-cht		wm	cht(matrix + aft detrital bt), higher grade Gow?
563582	5324204	61	03-BRB-636	mpo aggs		metasyenite	afp(micro)-epg	cht-bt′	op-tit(rhomb)-ap	ogs rk is gneiss (ie foliated granitoid?)
542787	5315603	62	03-BRB-638			metagranodiorite	plg-qtz-kf?	hn(grn)	act-epg-tit-ap	spiky act on hn, act-epg agg aft?
543206	5316105	13	03-BRB-641	ipo bt		mafic schist	hn-qtz-bt-grt	cht2(aft bt)	op	ts too thick, but NB grt-bt
543431	5316115	21	03-BRB-642	mpo cht, agg		qf metaclastite	qtz-wm-cht-plg	epg	op	
543083	5317083	11	03-BRB-648	msv		metabasite	epg-act-hn′-cht	op-plg-qtz	cb	
543219	5317155	11	03-BRB-649	msv		metabasite	act-epg-plg	cht	hn′-op-qtz	
543082	5316736	11	03-BRB-652	ipo		mafic metatuff	plg-cht-epg	qtz-act	op-tit(rims on op)	
565669	5327448	11	03-BRB-654	msv		metabasite	act(blgrn)-epg-plg	wm	qtz-op	wm-epg aft plg
565157	5328026	20	03-BRB-655			metawacke (Gow?)	qtz-p;g	wm-cht	cb-op	lithic clasts, Gowganda?
545392	5324749	62	03-BRB-658	m gsr, mrtxt		metagranodiorite	plg-qtz-kf	hn(grn)-cht	act-epg-tit-ap	cht aft bt, act spikes on hn
545502	5325191	62	03-BRB-659	m gsr, mrtxt		metagranodiorite	plg-qtz-kf	hn′(grn)	act-epg	act spikes on hn, epg-cht aft?
545189	5325888	62	03-BRB-660	m gsr, mrtxt		meta-qtz monzonite	plg-qtz-kf	hn′(grn)	act-epg-tit′-opap	some hn has act spikes
545242	5326033	13	03-BRB-661	mpo		metabasite(intm, mclte)	plg-hn	qtz-wm(aft plg)	epg	epg-wm aft plg, 13+11or lower
565114	5327739	32	03-BRB-663	msv		metaultramafite	am(clss)-cht-bt(brn)	op		
560091	5327555	11	03-BRB-666	m gsr, qtz vn		metavolcanic breccia	plg-matrix too fgr		cht-epg-cb-op	qtz veined metabrx, too fgr, veins deformed
566082	5320541	11	03-BRB-669	msv epg-cht vn		metabasite	hn′-cpx′	plg′	op-tit-ap-bt′-cht-wm	11 on ig, 11on13, cpx looks meta, wm aft plg
549134	5318251	11	03-BRB-670	bent bt		metabasite(lamp?)	cpx′-act-epg-akf	bt′-kf-qtz	op-ap-m/z	bt still stable but bent, no cht?
560817	5324243	12	03-BRB-673	msv		metabasite	2am-epg-plg-op		tit-qtz	variably coloured am, 2 amphiboles
562102	5327980	11	03-BRB-674	msv		intm metavolcanic rk	fp-act	op-cht	cpx′?	cht-cb-act amygs, act agg aft cpx
562102	5327980	11	03-BRB-675	msv		intm metavolcanic brx	fp-hn′-act	cht-cb-op		hn(ylbrn) zoned, clasts or inclusions?

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
562259	5327764	71	03-BRB-676	mpo defmd vn		metawacke cb-rich	cb-qtz-fp-wm	cht	op	min aggs(pebs?)=mpo, defmd qtz-cb veins
563351	5323625	61	03-BRB-678	msv		alkalic cpxenite	cpx(aeg)′	btr-cht	tit-ap-plg-op-wm	cht weird grn, cht aft bt, trace wm aft plg, 61?
562790	5324780	12	03-BRB-684	mpo wraps vari		metabasite	2am	op	qtz-plg-epg	varioles mainly am, am quite dk, ragged txt
536624	5319843	21	03-BRB-687	wpo plg, vn		metafelsite	plg	qtz	wm-cht-epg-op-cb	cb-epg veins, plg defines wpo (primary?)
527915	5318037	13	02-GL-201	msv		metabasite	plg-2hn(brn, grn)-op	un (in plg)		ts too thick, fuzzy txt, contact meta?
527475	5318043	11	02-GL-202	msv		metabasite (intm)	epg-plg-act	cht?	op-tit	plg full of epg, pre-meta alt?, fuzzy fgr again
530453	5311312	32	02-GL-208	msv		metaultramafite	am(clss)	cht-cb-op-wm		wm likely talc
531238	5316307	21	02-GL-209	msv		metasiltstone/wacke	qtz-plg	cht-cb-wm	op-tit	enough cb for 71
525138	5309506	11	02-GL-211	mpo cht		metabasite	plg-hn′-act-epg		op-tit-qtz	epg-cht after plg
533921	5312767	21	02-GL-212	msv		metaclastite	qtz-plg-epg	cht	tit-m/z	enough epg for 72?
530343	5310032	11	02-GL-213	msv		metabasite	act-un-bt	epg-cht	op-tit	NB unknown (grybrn bir epg?), SG overprint?
530000	5309852	11	02-GL-214	msv		metabasite (diabase)	cpx′-plg′-bt′		cht-act-stp-epg	NB stp
533793	5312392	11	02-GL-216	msv		metabasite (diabase)	cpx′-plg′	act-cht-epg	op	good overprint
530014	5310171	11	02-GL-217	msv rxl		metabasite	act-epg-cht-wm		op	grybrn epg (SG phase?), plg to wmchtepg
530455	5310662	71	02-GL-218	wpo		mafic metaclastite	qtz-plg-cht-op	cb		euhedral op, no act, cht-cb=11 or 71
530876	5312642	20	02-GL-223	msv		metawacke	qtz-plg-kf		cht(vfg aggs)	Proterozoic?
531791	5311167	11	02-GL-225	msv		metabasite/metaumaf	qm-epg?-am(blgrn)		grt	NB grt, but ts too thick, grybrn bir epg SG?
534803	5312656	20	02-GL-226	msv		metawacke	qtz-fp		cht-am-epg	detritalt grains? cht,am,epg, no clays/wm
526217	5314834	20	02-GL-227	layering defmd		metawacke	qtz-fp-cht	wm		wm in matrix, pseudos
526043	5315391	21	02-GL-228	msv		felsic metaclastite	qtz-plg-cht-wm		cb-op	more metad clay here, higher grade than 227
526454	5315464	20	02-GL-229			meta-lithic wacke	qtz-fp-wm-cht		cb-cht	vvfgr matrix, poorly sorted, Proter?
528609	5309794	10	02-GL-230			metabasite (diabase)	cpx′-plg′	cht-epg (meta)		no act, grade very low if at all
531985	5311951	11	02-GL-231	msv		metabasite	"plg"-hn′-wm(aft plg)	cht-epg-cpxr	act-op	low end of 11, lot of wm alt of plg
532293	5311982	11	02-GL-232	msv		metabasite	"plg"-am-wm(aft plg)	cht-epg	tit-op	most hn to act, act quite grn, lot of wm aft plg
532165	5312194	11	02-GL-233	msv		metabasite (diabase)	cpxr-plgr-wm(aft plg)	cht-epg-act-op	qtz-ab	again wm alt of plg
526046	5310549	62	02-GL-235	mpo agg		metatonalite/mclastite	plg-qtz-2bt	cb	m/z	relict bt and meta bt(fgr agg)
526129	5310486	11	02-GL-236	msv		metabasite (diabase)	cpx′-plg′	wm(aft plg)-op	cht-epg-bt-am	bt-am(blgrn) rim on cpx, less metd than above
528560	5312793	22	02-GL-237			metaclastite	fp-tit-epg-cht	bt(part to cht)-op		22 because epg with bt
532728	5311953	12	02-GL-238	msv		metabasite	2am-plg	epg-wm	cht-op	ign hn=11, meta hn=12, shreddy am, 12+SG?
532392	5311116	11	02-GL-239	msv		metabasite	act-plg	epg-op	cht	good 11, lg am = wpo? Localized
532251	5311096	11	02-GL-240	msv		metabasite	act(blgrn)-epg-plg	op	cht	some colour variation in am, little cht, lots epg
529044	5309798	11	02-GL-242			metabasite	act-epg(brn)	clz-op		plg + mafs all gone, brn epg=pum? Then SG
532101	5311018	11	02-GL-243			metabasite	act-plg	op	epg-cht-qtz	plumose act but all blgrn to plbgrn, no cht 12?
526329	5314481	20	02-GL-244	msv		metawacke (Gow?)	wm-qtz-fp	cht	op	fuzzy, lots visible wm, higher grade here
529030	5310037	11	02-GL-245	msv		metabasite	epg-cht-act-tit		op-qtz-cb	brn epg? Fgr
527077	5308681	61	02-GL-246	gsr mrtxt		metatonalite	plg-qtz	cht	tit-bt′	cht-tit agg after ign bt, only trace of bt left

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
527423	5309226	61	02-GL-247	gsr mrtxt		metatonalite	plg-qtz-cht	wm(aft plg)	tit-op	cht agg aft bt
527796	5309910	21	02-GL-248	rxl polygd qtzvn		metafelsite	qt-fp(-ve)		cht-wm-op	qtz vein polygd
528002	5310042	21	02-GL-249	msv polygd qtz		felsic metaporphyry	qtz-fp		wm-cht	polygd qtz vn
531183	5311812	11	02-GL-252	fractured		metabasite	plg(fresh)-cht-op		am (pre-cht)	11 or SG unsure
529324	5316925	62	02-GL-254	msv		metasyenite	afp	2am-bt' agg	cb-op-m/z-tit-ap	cht<1, photo op- bt agg aft px?, wy bt relict?
529324	5316925	11	02-GL-253	msv		metalamprophyre?	bt-am(blgrn)-plg	epg	op	ts too thick, too fgr uncertain
526030	5311719	21	02-GL-255	wpo		metawacke	qt-plg-wm	cht	cb	Protero?, higher grade Gow/lowgrd mclte?
522501	5356733	12	98CMV-001a	msv		2am metabasite	2am-epg-plg	op	cht-wm-tit	tit rims on op, 2am are blgrn and clss
522539	5356743	21	98CMV-002b	mpo agg, gsr		cht-epg metaclastite	plg-qtz-cht-op		epg-tit-cht-ap	
522733	5356745	21	98CMV-004a			cht-wm metaclastite	qtz-plg-cht-wm	op	m/z	
523121	5356832	11	98CMV-005c	msv		metabasite	plg-hnr-epg	act	op-tit-ap-wm	wm aft plg, meta act rims euhedral ign hn
523121	5356832	21	98CMV-005d	wpo		cht-wm mclastite	plg-qtz	wm-cht	op	
521244	5358275	21	98CMV-007a	mpo act		metabasite	act(clss)-cht	epg?-qtz-plg	op	act in mpo
521244	5358275	11	98CMV-007b	mpo		cht-epg metaclastite	plg-act/cht	epg		uncertain if grn mineral is cht or act
523703	5362518	62	98CMV-008a	mrtxt		alkalic metagranitoid	af	cpx(grn, zoned)	op-ap-tit-zi	spectac zoning in cpx(meta rim?), gsr/rxl
523703	5362518	62	98CMV-008b	mrtxt, gsr		alkalic metagranitoid	af	cpx-un	tit-zi	strained txt of fp=metamorphosed
523485	5360387	11	98CMV-010a	mpo act	mwm	metabasite	act-"plg"-wm(aft plg)	cht-epg	tit-op	photo op act ps aft cpx
523005	5360135	23	98CMV-014c	mpo am, agg		hn-epg metaclastite	plg-qtz-epg-hn	cht?	op	
523136	5359670	13	98CMV-015-03a	mpo agg		hn metabasite	plg-hn	op	qtz-tit-ap	hn postdates in part main defm
523148	5359701	21	98CMV-015-04a			"hn-bt" metaclastite	plg-qtz	epg-cht	wm-am'	21 on 23 probably, cht ps aft bt, hn
522816	5359006	12	98CMV-018a			metabasite	plg"-am-epg		op-tit	am is hn colour, act text/birefrin, no cht so 12
522816	5359006	62	98CMV-018b	mpo agg, gsr		hn metatonalite	plg-qtz	hn-epg-cht	op-tit	hn deep blgrn (ign), fgr agg hn=still stable, 62
522852	5359045	11	98CMV-019b	mpo agg	mwm	metabasite	"plg"-act-wm(aft plg)	cht	un(isotropic red)	
522378	5359785	22	98CMV-027b	ipo clasts, agg		bt-am metaclastite	plg-qtz-am-bt	op	epg-cht-wm	cht in part cht2, epg poiks overgrow mpo
522382	5357629	21	98CMV-029d	ipo cht, aggs		cht-op metaclastite	plg-qtz-cht	op	tit-wm-cb-epg	looks like yk defm zones, possible cren
521738	5359742	11	98CMV-033a	ipo cht hsz		cht-epg-op schist	cht-qtz-op-epg		act	11 inspite of high qtz
518249	5365387	21	98CMV-101a	ipo agg augen		plg-cht phyllite/hsz	plg-cht-tit?	qtz-cb	op	
518050	5365117	21	98CMV-106a	ipo wm, cren		wm-cht phyllite	plg-qtz-wm-cht	cb	op-tit	cb extension vns, like 101a
517068	5363054	21	98CMV-109c			cht-wm mclastite/por	plg-qtz-kf?-cht		wm-tit-op-ap	cht agg with op/tit
518537	5362289	21	98CMV-203c	ipo ll bdg		wm-cht metawacke	plg-qtz-wm	cht-op(gra)		
517346	5363811	21	98CMV-205f	m-ipo wm, cren		su-wm-cht mwacke	plg-qtz-wm-su	cht	grt?/tit-ru-to	mineralization is pre-metamorphic, to
517520	5363505	41	98CMV-206h		iwm	mwmaltd fel mclastite	wm-qtz-"plg	op		impressive wmalt of plg
517500	5363361	21	98CMV-207b	w-mpo cht		wm-cht fel mporphyry	plg-qtz	wm-cht	cb(veins, blebs)	mpo=primary flow feature?
516244	5362310	61	98CMV-208a			cht-epg mgranodiorite	plg-qtz-kf	bt-hn-cht-epg	tit(rhombs), ap	cht-epg aft ign bt
516244	5362310	42	98CMV-208c	mpo wm ll bdg		bt-ps knotted phyllite	qtz-plg-bt-wm-ps	cht(ps/lyr)	epg-op	bt ok but porphys of ? to cht-wm, 42 on 43?
517383	5363232	21	98CMV-209d			wm-cht metaclastite	qtz-plg--wm	epg-cht-un	op	un=amorph brn assoc w/ op

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
517383	5363232	21	98CMV-209l	mpo		heterol cht-cb mclste	qtz-plg-wm-cht-cb		op	cb patches, augen, various lithoclasts
519682	5366279	21	98CMV-300d	mpo hsz?	cbwm?	cht-wm-cb mclastite	qtz-plg-cht-wm-cb		op-epg	cbwmalt or primary sedimentary origin
519682	5366279	21	98CMV-300f		mcb	cht metaporphyry	plg(-ve)-qtz	cht-cb	wm-m/z-ap	is cb alt or primary?, wm only in phenos
516453	5350547	11	99CMV-004c	mpo some am		metabasite	act	epg-cht-bt-op	qtz	act predom, not all am in mpo
521528	5348649	12	99CMV-007a	m-ipo am, agg		2am metabasite	act-hn-op	pllg-qtz		heteor am, colour zonation
521588	5348001	11	99CMV-016c	mpo act, agg		metabasite	plg"-act-hn'	cht	epg-op	relict ign hn with act rims
529909	5337713	61	99CMV-034a	msv		cht-epg metatonalite	plg-qtz	am-cht(aft hn, bt)	tit	cht-epg aft ign bt, cht aft am
529509	5344535	52	99CMV-039a2	am polyg arcs		meta-iron formation	cum-op-su			metabrx txt, could be metamineralization, phop
529509	5344535	52	99CMV-039a4			meta-iron formation	cum-op-su		cht-fp?	
528681	5344522	73	99CMV-050a	lyr	icb?	cpx-epg-hn gneiss	hn-qtz-plg	epg	cpx-op	calcsilicate rock,
528486	5344612	13	99CMV-056a			metabasite	plg-hn-qtz-op		tit	streaky rock, fgr for amphibolite
516648	5349788	23	99CMV-061a	mpo bt		bt-am metaclastite	qtz-plg-bt-am		cht-op-ap	am in acic bundles, blgrn/grn
516559	5350389	73	99CMV-062a2	mpo augen	icb?	epg-cpx metaclastite				
516634	5350009	23	99CMV-063a			hn-bt metaclastite	plg-qtz-am	epg	bt-m/z	cb + bt = am + kf?
516604	5350106	21	99CMV-065d	msv		cht-wm metaclastite	plg-qtz	cht	wm-un(prn?)	un=length fast, fibrous in vn prn?
516699	5350125	11	99CMV-066c	mpo act, agg		act-epg metabasite	act	epg	qtz-plg-tit-cht	
516451	5350466	11	99CMV-067a	mpo act, agg		act-cht metabasite	plg-act	cht-op	bt-m/z	some cht aft bt, cb-qtz vn
516446	5350428	23	99CMV-068a1	wpo		bt-am-grt metaclastite	plg-qtz-bt	am-un1-grt	un2	un2=margarite possibly, am blgrn, un1=epg?
529538	5344472	73	99CMV-069a2	msv	icb?	calcsilicate rock	am(clss)-diopside	epg-cht	wm(tlc?)	blebb txt, metacbalt, limey seds?
529538	5344472	23	99CMV-069b2	mpo agg		am-bt metaclastite	plg-qtz-cum		cht-bt-op	epg? vn, if not ca-amphibole, could be mAlalt
529538	5344472	23	99CMV-069b3	mpo agg bt am		cum-bt-marg? rock	am(clss)-bt	op	un	un=length fast wm margarite?
529538	5344472	73	99CMV-069c2			metamineralization				
529556	5344423	11	99CMV-070a	mpo cht, agg		metabasite/umafite	am(clss/plgrn)-cht	epg-op		possibly metaumaf, no qtz plg, mg cht
529556	5344423	32	99CMV-070c			metaultramafite	am(clss)-op		cht-tlc	orig cgr rk, pseudomorphs to 4mm
529575	5344398	52	99CMV-071c			mchemsed/mineralizat	op	am(clss)	bt (pale)	could be metamorphosed mineralization
529575	5344398	61	99CMV-071d	gsr rexl		epg-cht metatonalite	plg-qtz		cht-am-bt-tit	gsr all through rk, cht aft bt but some bt ok
523313	5356329	12	99CMV-073a1	msv		2am metabasite	am-epg-cht-plg-op		wm-tit-cb-hn'	am(clss to plgrn, blgrn to plgrn), wm aft plg
517887	5349419	23	99CMV-202c	mpo bt, agg		bt-hn metaclastite	plg-qtz-bt-hn-epg		tit-op	mpo wraps around plg 'clasts'
516970	5349600	41	99CMV-203b	mpo ll bdg		wm-cht metasiltstone	wm-qtz-cht-plg	op(gra +?)	ru-to	lots of gra, wm ps after? some cht aft bt?
516970	5349600	22	99CMV-203d	mpo agg, am		am-bt metaclastite	qtz-plg-am	cht	bt-op	am agg aft mafic minerals
517983	5348733	52	99CMV-204c	lyr		chem msed/metaminer	qtz-su(cpy)	cht-wm-plg	bt	metamineralization, wm ps aft and/crd?
516744	5350042	23	99CMV-205b	mpo agg	wwm	bt-hn-epg metaclastite	"plg"-qtz-bt-am-wm	epg	op-tit	most plg to wm, am=blgrn hn
516572	5349766	23	99CMV-206a	mpo am, agg	wwm	hn-bt-cht metaclastite	plg-qtz-hn	cht-wm(aftplg)op	bt-epg-m/z	am in mpo again
516572	5349766	23	99CMV-206d	mpo bt, am, ag		am-bt-epg metaclastite	qtz-plg-am	epg	bt-wm-op-tit-m/z	bt and am in mpo, wm aft plg
517911	5350866	22	99CMV-207a	ipo am,agg		act-bt-epg metaclastite	qtz-plg"-act	cht-bt-epg-op		augen of plg to wm-epg, looks low grade, 22
517911	5350866	22	99CMV-207c	ipo act, agg		act-bt-cht metaclastite	plg-qtz-act-op	bt-su		sulphide-rich version of 207a

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
517911	5350866	22	99CMV-207d	mpo agg	wwm	act-cht-bt metaclastite	qtz-"plg	act-wm-cht	bt-op-tit	most plg to wm-epg, some wm not ps
517911	5350866	21	99CMV-207e	mpo locally		su-rich metaclastite	qtz-su	plg-wm	cht	wm aft plg but some is main phase
517344	5350860	11	99CMV-209b	mpo am	wwm	act-cht metaclastite	plg-qtz-act	cht-wm-op	cb-un	wm aft plg, flattened cm-scale clasts
517132	5349420	42	99CMV-210a	ipo wraps ps	wwm	ps-cht-wm phyllite	qtz-wm-op-ps	cht	to	ps after and so 41 on 43 but no bt now
518694	5354277	11	99CMV-211a	mpo clasts, agg		metabasite	epg-qtz-plg	cht-act		fldd qtz vn, mpo axpl to fld, could be interpil
517956	5356423	22	99CMV-213b			intm/clsl metaclastite	epg-qtz	act-un	bt	interpillow material?, segregation?
521633	5354077	13	99CMV-215a	msv		hn-epg metabasite	hn-epg-plg"	wm(aft plg)	cht-qtz-op-tit-m/z	wm aft plg
516897	5349841	23	99CMV-218d	mpo agg, am		hn-bt metaclastite	plg-qtz-hn	bt-op	epg-m/z	
516515	5350303	23	99CMV-221b			hn-bt heterlit mclastite	qtz-plg-hn-bt	cb	cht-tit-op-to	cm scale felsic clasts, vfgr matrix
516492	5348229	23	99CMV-501a	mpo agg		hn-bt metaclastite	plg-qtz-hn-bt	epg	bt-op-tit-ap-m/z-	
516492	5348229	61	99CMV-501d	gsr rexl		bt-cht metagranite	plg-kf-qtz		bt-cht-wm-tit-m/z	orig cgr rk, gsr of lger fp and qtz grains
518379	5346370	13	99CMV-530a	lyr, mpo hn		amphibolite gneiss	hn-plg-qtz	op	tit	faulted layering
518379	5346370	23	99CMV-530e	mpo hn variable		hn metaclastite	plg-hn-qtz		op-tit cht-epg	cht-epg at cnt of 'clast', hn lined up and not
518379	5346370	13	99CMV-530f	wpo hn		hn metabasite	hn-plg	qtz-wm-tit	op	ts to naked eye is fuzzy, contact aureole?
518462	5346715	13	99CMV-532e	ipo hn, augen		hn metabasite	hn-plg		qtz-op	defm defiinitely overlapping with peak meta
522792	5348458	13	99CMV-541a	mpo + hsz, hn		hn-epg metabasite	hn-plg	qtz-epg	tit-op	epg-cb vn in hsz, hn-cht in hsz cutting hn mpo
522374	5346722	13	99CMV-543b	ipo agg, hn		hn-bt mclste/intm mvol	plg-hn-qtz	bt-op	wm-cum-act	maybe bt-hn mclastites are intm mvolc
520741	5348786	23	99CMV-546b	ipo bt, hn, agg		hn-bt mclste/intm mvol	plg-hn-qtz	bt	cb-op-ap	hn-bt mpo
521105	5348210	12	99CMV-547d	ipo locally, am		hn metabasite(amphib)	hn-plg	qtz-am(clss)	op-bt(seam)	some clss am patches in some hn grains
520943	5348503	13	99CMV-554a	ipo hn agg		hn metabasite	hn-plg	qtz	op	amphibolite, strain at peak meta conditions
520332	5349380	13	99CMV-557a	ipo hn, fldd vn		hn metabasite	hn-plg(~qtz)	qtz	op-bt	ipo axial planar to folded polygd qtz vn
520302	5349384	12	99CMV-561a	mpo am, ag, bt		htero am mbasite/intm	plg-qtz-am-bt		op-tit	am is blgrn-olgrn but w/ pale zones
512278	5355219	23	99CMV-563a	m-ipo am, bt ag		am-epg-bt gneiss	qtz-am-epg-plg	bt-op	cht-m/z	cht2?, parts of rk qtzamphibolite, agg of am
521696	5348014	23	99CMV-567b	wpo		hn-epg-su metaclastite	qtz-plg-hn-su-epg		cht	most su along vns, fracts;
521847	5347755	22	99CMV-573a			am-"bt" metaclastite	plg-qtz-am-"bt"-op			vfgr, pale am, most bt altd to ?
524483	5345295	22	99CMV-581a	ipo am		act-"bt" metaclastite	plg-qtz-act	"bt"-cht(aft bt)	wm(aft plg)-op	am in P shadows at ends of augen
524497	5345477	23	99CMV-588b	mpo clasts, agg		am metaclastite	plg-qtz(clasts)-am	op	cht	NB rounded felsic 'clasts', am blgrn
512691	5349221	22	99CMV-595a	ipo agg, plg		bt-epg-act metaclastite	qtz-plg-bt-epg-2am	cht-wm	tit	wm aft plg, wm-ep zone II ipo, mylonite?
525192	5345198	12	99CMV-596	wpo agg		2am metabasite/intm	plg-2am	qtz	epg-op	hetero am, act, hn; act ps aft? texture hetero
525192	5345198	32	99CMV-596b1	mpo act agg		metaultramafite	act/am(clss)		op	pale grn/clss am, could it be tremolite?
525051	5345364	13	99CMV-599a	msv-wpo cb vn		hn metabasite	hn-plg		epg-op	epg patchy distribution,
525148	5345329	13	99CMV-600a	ipo hn, agg		hn metabasite	hn-qtz-plg	tit	cpx-epg, op-wm	cpx-epg in segregation at end of 'clast'
529244	5350810	62	99CMV-602a			act-cht metatonalite	plg-qtz	am-epg	act-cht-tit	act-cht-epg metamorphic on hn tonalite
461649	5361506	21	00CMV-001a			epg-cb metaclastite	qtz-plg	wm-cht-epg-cb	op-tit-kf?	epg-cb could be 22
459711	5365795	22	00CMV-010a			fel metahyaloclastite	qtz-plg	wm-op-kf?	bt-cht-un2	nb preserved hyaloclastite texture
459677	5365858	22	00CMV-011a			fel metaclastite	qtz-plg(-ve)	wm-cht-kf?	bt-op	

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
459930	5365862	11	00CMV-015a			metabasite	cht-plg(-ve)	qtz-tit-cb	bt-epg-ap-kf?	
459779	5366549	21	00CMV-016a			fel/intm metaclastitte	qtz-plg-cht	wm-cb-kf?	epg-op-act?	
459510	5366603	21	00CMV-017a	mpo		fel metaclastite	qtz-plg-wm	cht-cb-kf?	op	
460019	5363297	71	00CMV-018a	mpo wm, cht		qf metaclastite	wm-cht-cb	qtz	op-to	nb to and enough cb for 71
460350	5363493	71	00CMV-022aa	brx text		cb-cht metabreccia	cht-cb-qtz	op-un		
460350	5363493	71	00CMV-022ab	ipo cht, wm		phyllite/HSZ	wm-cht-cb	qtz	op-ru	
455899	5366546	21	00CMV-023a			qf metaporphyry	qtz-plg-wm(2?)	cb	op-ap-m/z	
458895	5362695	21	00CMV-027a1	ipo hsz		felsic phyll/hsz	qtz-plg(-ve)-wm	cb-kf?		
458926	5362945	71	00CMV-028b1	ipo hsz		phyllite/HSZ	qtz-fp-wm-cht-cb	op		
459757	5362269	11	00CMV-029b	qtz vns		metabasite	cht-epg-qtz	plg	op-un-act?	
459651	5361482	70	00CMV-032a	ipo hsz		phyllite/HSZ	cht-cb-prn	wm-qtz-tit	op	nb prn!
458130	5359831	11	00CMV-041a2			metabasite	cht-epg-act	plg-qtz-cb	op-tit	
457688	5360276	11	00CMV-048a			metabasite	cht-epg-act	plg-qtz	op	
457577	5360149	11	00CMV-049b	mpo		metabasite	plg-epg-act-stp	cht-qtz-tit		blotchy rk, nb stp in metabasite
457734	5360057	11	00CMV-052a			metabasite	epg-act	plg-cht-tit		
463812	5364779	22	00CMV-059a	cht-cb vein		metaclastite	cht-epg-cb	qtz-(plg)-wm-act	op	cht cb vein
464941	5366322	22	00CMV-061a			epg metaclastite	cht-epg	qtz-plg-cb	bt-op	
458775	5358129	52	00CMV-075a1			metaFe	am-op-un	epg-hn-plg-tit		
458775	5358129	72	00CMV-075a2			calcsilicate rock	plg-un	epg-act-cb	wm2	
458775	5358129	72	00CMV-075a4			calcsilicate rock	plg-cht-un	epg-act-cb	wm2	could this wm2 be talc?
458775	5358129	72	00CMV-075a5			calcsilicate rock/fefm?	plg?-op-cb	wm-bt-cht-act?		
458775	5358129	52	00CMV-075a6			su-qtz meta-Fefm	qtz-py-cb-plg?		bt-cht	
455880	5365837	21	00CMV-087a	rexl qtz-cb vein		intm plg metaporphyry	plg-cht-cb	wm-qtz	op-ru	
455821	5365937	21	00CMV-088a			metafelsite	qtz-plg(-ve)	wm-cht-cb-kf?	op	
455821	5365937	21	00CMV-088b2			intmed metavolcanic	qtz-plg-cht-wm-cb	kf?	ru?-op	
455787	5365793	71	00CMV-092a			felsic metaclastite	plg-cht-cb	qtz?-op	ru	
458636	5357792	21	00CMV-100a	m	cbwm	metafelsite	qtz-plg(-ve)-wm-op	kf?-cb	un	m cbwm alt
458699	5357517	62	00CMV-101a			metasyenite	kf-am		bt-cpx'-tit-cb-ap-mz	is all am meta?
459211	5364200	71	00CMV-106a			"marble"	su-cb	qtz-wm		is wm tlc?
457774	5357986	12	00CMV-118a	vein epg		metabasite/epg alt	kf-am-plg-epg-cht		op-cb	cht2?, epg1 and/or epg2 epgaltd grnst?
458983	5361477	11	00CMV-124a	mpo	?	maf mvolcaniclastite	wm-cht-epg-act-(plg)		qtz	pre-, syn-meta wmalt of plg
459225	5359023	71	00CMV-125aa	mpo lyrd		cb-cht metaclastite	wm-cht-cb		op-qtz	laminated ll mpo
459225	5359023	71	00CMV-125ab	mpo cht, cb vn		cht-cb schist/hsz	cht-cb		qtz-wm	
474783	5361920	21	00CMV-202b			fels metaclastite	cht-plg-qtz-kf?	wm-epg-cb	ru	
474154	5362193	51	00CMV-206e2			su-qtz meta-Fefm	qtz-su	cht-cb		
474154	5362193	41	00CMV-206g	mpo vein		qtz-wm	cht-cb-op	to		qtz-cb vn, plg?

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
475061	5360027	32	00CMV-212a	qtz vn		cum	op	cht-epg		
472376	5362165	31	00CMV-218a2	fol cht seams		metaultramafite	tlc-cht-cb	op		nb foliated cht seams
472376	5362165	21	00CMV-218d	mpo	wm?	qf metaporphyry	qtz-plg-wm-kf?	cb	op-ru	possible wmalt, wm-cb = 21
472300	5361818	21	00CMV-219b			fel metaclastite	wm-plg-cb-qtz-kf?	cht	to-ru	
472841	5361900	21	00CMV-220a1	wpo		fels metaclastite	qtz-plg-wm-epg	kf-cht	tit	heterogeneous/irregular texture
472841	5361900	21	00CMV-220a2			metaclastite	plg-wm-qtz-cb-chtepg	kf?		enough cht for 71?
472199	5361259	22	00CMV-222a			fels metaclastite	plg-qtz-epg-kf?	cb	cht-am	am-epg = 22
472041	5361105	31	00CMV-223a1			metaultramafite	tlc-se	op-cb		spectac rims of tlc-se, metadunite?
472224	5361177	11	00CMV-224a			metabasite	epg-act		cht-qtz	
471210	5365002	21	00CMV-232a			metaclastite	plg-wm-qtz	cht	tit-m/z	
469536	5359826	61	00CMV-234a			metagranite	qtz-kf-plg	bt')-epg2	wm2-cht2-tit	wm-cht-epg = metamorphic, some cht aft bt
471950	5364233	41	00CMV-241a	vein	m	metaclastite/meta-alt	qtz-cht cb-su(vein)	wm		qtz-cb-su vein, altd? Meta-alt?
471950	5364233	21	00CMV-241b			metaclastite	qtz-plg-cht-epg-cb	tit-kf?		enough cht for 71?
474921	5363502	32	C0CMV-243a			metaultramafite	am (2 am?)	cht-op	tit-op	
476164	5358722	71	00CMV-244a	ipo cht		phyllite/HSZ	plg-qtz-cht-cb		tit?	metamylonite?-kf?
476032	5358792	L	00CMV-245a		?	diabase meta?	cpx'-plg'	am-op-ps	bt-hn'-ap	metamorphic am? Bt ign or meta?
475290	5366575	71	00CMV-247a			cb-rich metaclastite	cht-qtz-plg-cb	ru		kf?
475173	5363613	22	00CMV-250a	hsz		maf metaclastite	qtz-plg-cht-epg-act-un			kf? Act = 22, what about 11?
465331	5357559	41	00CMV-252a			metaclastite/phyllite	wm-plg-qtz	cht-cb-to	op	nb lots of to
455983	5358569	11	00CMV-259a	mpo vein		metabasite	plg-cht-epg-act	qtz		qtz-cht-epg vein
457006	5358857	71	00CMV-260a	hsz in		metaclastite	epg-qtz-cb	wm-cht		hsz cuts across
466586	5361918	31	00CMV-263a	mpo metabrx		metaultramafite	cb	se-cht?-qtz?	tlc?	
459894	5358092	11	00CMV-267b			metabasite/intm	plg-epg-un	qtz-cht	op	amygs or varioles?
459894	5358092	21	00CMV-267c			fel metaclastite	qtz-plg-kf?	wm-cht	op	
471427	5362716	21	00CMV-274b1			metafelsite	plg(-ve)-qtz-kf?-chtcb	ru		
476750	5359771	31	00CMV-278a			metaultramafite	cb-se	op		
459263	5358619	21	00CMV-286a			metaclastite	plg-wm-qtz	cht-cb-kf?	op-ap-to	enough wm for 41?
459283	5357203	61	00CMV-298a	m		metagranite?	qtz-kf-plg	cht-op-cb		auto alt?
458926	5357127	21	00CMV-300a			metaclastite	qtz-plg-wm-cb	cht-kf?		enough wm for 41? Cb for 71?
474750	5363525	11	00CMV-302b			metabasite	plg-epg-act	cht	cpx'-op	
473823	5363324	61	00CMV-305a			metagranite	qtz-kf-plg(-ve)	epg-wm2-cht2-bt'	op-wm'	wm2-cht2-epg are metamorphic
475082	5359242	22	00CMV-401a	mpo		metaclastite	qtz-plg(-ve)-act-cb	cht	op-tit	why not 11? Too much qtz?
475439	5359266	12	00CMV-403a	mpo		metabasite	epg-act	plg-hn-tit-qtz		
455802	5366530	61	00CMV-415a			intm dyke, hi level plut	qtz-plg-cht	wm(2?)-cb	op-ap-m/z	
455692	5366435	21	00CMV-418a	mpo wm, cht		fel metavolcanic rk	qtz-kf-plg-wm-cht	epg-op-tit		
457791	5365863	22	00CMV-429a			fel metaclastite	qtz-plg-wm-kf?	bt-cb	cht	

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
457442	5357802	62	00CMV-431c			meta-alkalic granite	kf'-cpx'	plg'-act-2tit-un	epg-cb-ap	one tit meta, one ign, act is meta
465124	5362877	72	00CMV-507a			cb-rich metaclastite	wm-cb-op-tit-phlog			blebby phlog
464374	5362327	21	00CMV-519a	mpo		metaclastite	qtz-plg(-ve)-wm-cb	cht-kf?	op-m/z-ru	
464530	5361973	21	00CMV-601a	mpo		metaclastite	qtz-plg-wm-kf?	cht-epg-cb		enough cb for 71?
464821	5361845	21	00CMV-602a	ipo		fel metaclastite	qtz-plg(-ve)-wm-kf?	cht-cb	epg	
464821	5361845	21	00CMV-602b	mpo		fel metaclastite	wm-qtz-cb-plg(-ve)	cht-kf?	to-ru	
464721	5361917	21	00CMV-638a	mpo		metaclastite	qtz-plg-wm-cht		ru	
464721	5361917	21	00CMV-638b	mpo		metaclastite	plg-qtz-wm-cht	tit-cb		
464627	5361972	21	00CMV-639a	mpo		metaclastite	qtz-plg-wm-cht-py	cb		
464627	5361972	21	00CMV-639b	mpo		metaclastite	wm-plg-qtz	cht	epg-op	
464627	5361972	21	00CMV-639d	mpo		metaclastite	qtz-plg(-ve)-wm	cht-cb-kf?	op	
473688	5362197	31	00CMV-701a	mpo		metaultramafite	tlc-op-cht		cb	
473733	5362249	21	00CMV-702b	mpo		metaclastite	qtz-plg wm	cht-cb-kf?	op-to	
471537	5362548	31	00CMV-705a	mpo		metaultramafite	tlc-cht-op			relict spinifex
471637	5362576	31	00CMV-706c	mpo		metaultramafite	tlc	cht	ru	
471637	5362576	71	00CMV-706d	ipo hsz		metaclastite/hsz	qtz-cht-cb-plg	wm2-kf?	op	
471814	5362708	21	00CMV-708a			fel metaclastite	plg-wm-qtz	cht	op	
471714	5362482	22	00CMV-709a			mafic metaclastite	plg-wm-qtz-epg	cht2-am-kf?		am = 22, too much wm-qtz for 11
471714	5362482	21	00CMV-709b			metafelsite	plg-wm-qtz-cht-kf?	op		
466946	5363321	11	00CMV-807g	cren of fln		metabasite	epg-act-qtz-op-cb	plg-cht		interpillow material
467273	5362068	21	00CMV-809b			fel metaclastite	qtz-plg-wm-cb-kf?	cht	op	enough cb for 71?
457253	5345684	61	01LAH-001			metatonalite	qtz-plg	bt'-cht	wm-2epg-tit-ap	m/z, wm-cht-epg = metam, some epg is ign?
456982	5352684	31	01LAH-002a			metaultramafite	cb-se	tlc	tit	
456982	5352684	31	01LAH-002b			metaultramafite	cb-se		tlc-op	
448890	5353820	21	01LAH-003			fel metaclastite	qtz-wm-cht-su	epg	to	
449240	5353944	21	01LAH-004a			metaclastite	qtz-wm-cht-epg	plg?-ru	op-to-un	
449240	5353944	21	01LAH-004b			metavolcaniclastite	qtz-(plg)?-wm-cht-epg		cb	
449240	5353944	11	01LAH-004c			metabasite	cht-epg-act		qtz-plg-op-tit	
448867	5352761	71	01LAH-008	ipo hsz		cht-cb-phyllite/hsz	qtz-cht-cb	plg?	op	
448787	5352621	21	01LAH-010			metaclastite	qtz-cht-epg-cb		wm	
451622	5356847	21	01LAH-013		prem	meta-altd qf porphyry	qtz-plg-wm	cht-cb	op	pre-metamorphic alt of felsic rock
451811	5357787	61	01LAH-017			metatonalite	(plg)-qtz-wm-cht-epg	(bt)		wm-cht-epg=meta, wm aft plg, cht aft bt
447205	5360077	12	01LAH-022a	hsz		metabasite	plg-cht-epg-hn	act-tit-qtz	op	cht likely later retro, lyr due to high strain?
447205	5360077	61	01LAH-022b			metatonalite	qtz-plg-hn'	bt'-wm-epg	cht-tit-m/z	
446573	5360411	13	01LAH-026	msv, hn vn	w wm	metabasite	hn-plg(some wm alt)	wm(aft plg)	qtz-op	qtz-act-epg vn too cuts hn rich lyrs, vfgr
446412	5362058	11	01LAH-028	mpo am, bent		metabasite	plg-act	cht-epg	qtz-op-tit	am defining mpo bent, broken, disequilb txt

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
446394	5361930	13	01LAH-029a	w-mpo hn ll lyr	wm	amphibolite gneiss	hn-epg-wm(aft plg)	cht-tit-bt	op-qtz?	gz on az, main defm w/ hn stable
446485	5361140	13	01LAH-032	mpo, gsr hn	wm	high strain amphibolite	hn-"plg"-	wm-epg-qtz-op	tit(fuzzy)	wm-epg aft 13 plg? 13+11?, hn stable hsz
449520	5354494	71	01LAH-037	mpo	i-wm	altd amphibolite?	cb-wm-cht	op		iwmcbalt,
452645	5358676	21	01LAH-041a		to	felsic metaclastite	wm(matrix, aft plg)-qtz	cht-op-to		to up to 2 mm long
452645	5358676	52	01LAH-041b	wm-am, qtz vns	wm?	meta iron formation	mt-qtz-gru-"plg"(wm?)			wm? aggs aft plg?
452645	5358676	22	01LAH-041c			intm metaclastite	bt-cht-qtz-epg-op			epg concentrated in frags/clasts
448649	5362249	21	01LAH-043a	mpo wm, agg		felsic metaclastite	wm-plg-kf?-qtz	op	cht-ap	wm mostly in matrix, some aft fp
448625	5362831	72	01LAH-045a	msv		low grade clsl rk	epg-qtz-plg	cht	cb-act-tit-op	tit rims on op, not a phyllite
448560	5362862	21	01LAH-046b	w-mpo	to? wm	meta qtz arenite/felsite	qtz-wm	cht	to-op	to prominent, wm aft fp?, meta-altd felsite?
447882	5362595	21	01LAH-048a	mpo wm, agg		felsite/fels metaclastite	qtz-fp-wm	cht		could be metatuff
447882	5362585	22	01LAH-048b	mpo	wm?	intm metavolcanic rk	plg-wm-cht	act-un-qtz	un(brn epg?)-op	could cht be secondary?, wm aft plg in part?
447675	5362522	21	01LAH-051d	mpo, qtz-epg vn		felsic metaclastite	fp-qtz-wm	cht		qtz-epg vein, xl metatuff possibly
447004	5362536	13	01LAH-054			metabasite	hn-op		grt-bt	spectac frag text outlined by op in matix, grt!
446487	5362586	13	01LAH-056a	mpo hn, epg vn		metabasite	hn-plg"(some wmalt)	epg-qtz	cht-op-wm	bleaching near epg veins
446456	5362885	22	01LAH-060a	mpo aggs		felsic metaclastite	qtz-fp-wm	bt(grains,seams)		bt in good shape
447054	5363382	12	01LAH-0061			intm mvolc/clsl rk	epg-plg-qtz-2am	op-cht		epg vn, cb-epg vn, hn distrib irreg, act limited
447054	5363382	21	01LAH-061a			felsic metaclastite	qtz-epg-plg"(wm)-wm	cht	tit-op-cb	epg, cht aft bt?, if so 22+21
447054	5363382	52	01LAH-061b			meta iron formation	qtz	hn-op-gru	bt-cht(aft bt)	clots of hn as in 054, 041c
452274	5358589	52	01LAH-074			meta iron formation	qtz-am-op-stp		cb?	NB stp
455119	5352162	52	01LAH-077a	ipo lineation?		meta iron formation?	am	qtz-epg-cht		52 or possibly 32
453872	5352098	13	01LAH-080	ipo hn, epg vn		metabasite	hn-plg	qtz-op-wm		wm aft plg, intense hn preferred orientation
453722	5354117	31	01LAH-081a	mpo		metaultramafite	cht-se-cb-tlc-op			
449357	5354764	12	01LAH-083			metabasite	act-act w/ hn core-epg	tit-op	plg-qtz	locally hn looks older (ign?)
449519	5354812	61	01LAH-084	gsr, polygd qtz		metatonalite	"plg"(epg)-qtz	"hn′-(cht + op)	"bt′"(cht)-op	strained but not foliated in ts
448682	5354190	11	01LAH-092	msv pillow rim?		metabasite	am-epg	cht	op-tit	vfgr greenstone some zones free of epg
452113	5356450	61	01LAH-096	intense defm	wmcht	altd miner metatonalite	qtz-su-cht-wm	un assoc w/ su		spectac defm of qtz, NB defmed mineraliza
452113	5356450	41	01LAH-096a	ipo hsz	i-wm	phyllite aft tonalite	qtz-su-cht-wm			un w/ su, defmd-mineralized mtonl, wm aft plg?
453783	5354312	32	01LAH-102a	ipo		metaultramafite	cum	cht-se		
453783	5354312	11	01LAH-102b	act in vns		metabasite	plg-act-epg	cht	tit-op	qtz-cb-act prisms in veins
455628	5357692	11	01LAH-103a	mpo agg		metabasite	plg-act-epg-cht		qtz-tit-op	
455628	5357692	71	01LAH-103b	hsz?		mafic metatuff	qtz-cht-cb-un(epg?)			vfgr laminated likely metatuff
452128	5355611	11	01LAH-104	mpo op, act		metabasite	act-epg-cht	plg	op-qtz	most plg to cht-act-epg, epg vn
452214	5355772	11	01LAH-105c	msv, epg-cht vn		metabasite	epg-cht	act-plg	qtz-op-cb	
453996	5352193	11	01LAH-107	ipo am, agg		metabasite	act-plg	epg	cht-op-qtz-cb	epg vns, intense po
453996	5351847	32	01LAH-109	msv		metaultramafite	am(clss)	cht		most likely metaultramafic rk
453702	5350397	73	01LAH-111a	layered		amphibolite gneiss	plg-hn-act-qtz-epg		tit-di	hn and act-hn, trace diopside

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
453702	5350397	13	01LAH-111b	ipo, lyr, qtz vn		amphibolite gneiss	hn-plg	qtz-wm(aft plg)	bt-tit-op	wm alt of plg assoc w/ qtz vns
453702	5350397	13	01LAH-111c	mpo cut by hsz		metabasite	hn-plg-wm(aft plg)	op	qtz	13 grade defm
453702	5350397	11	01LAH-111d	msv		metabasite(diabase)	plg′	cpx′-psA-act	qtz-tit(eundral)-cb	diabasic txt, contrast to 111c
453702	5350397	61	01LAH-111e	gsr, polygd qtz		metagranodiorite	plg-qtz	kf	epg-bt(unhealthy)	epg could be metamorphic, bt not happy
453702	5350397	72	01LAH-111g	mafic mpo		calcsilicate gnss/grtd	2am-epg/plg-qtz	plg/kf	qtz-tit/bt-epg	grtd lyr/clsl gnss, mafic lyr po bent around fel
453244	5349675	61	01LAH-112	wpo	mwm	metatonalite/granodior	plg"-qtz	kf-wm	bt"-epg-cht	bt locally chtizd, epg possi aft bt, wm aft plg
452928	5349603	11	01LAH-113a	gsr, rexl, pstac		mafic metaclastite	plg-/qtz	act-epg-cht/kf	tit-op	fels frag in mafic matrix, pseudotachylite
452928	5349603	62	01LAH-113b	wpo agg		kf megx metagranite	plg-qtz-kf		bt-epg-cht(aft bt)	bt polygd, epg overgrows bt, cht aft bt
452928	5349603	12	01LAH-113d	ipo w/ fracts		intm metaclastite	plg-act-hn-epg	qtz	kf-tit(prominent)	ipo w/ anastomosing fracts, 2am-epg happy
452447	5349452	62	01LAH-115a	mpo		kf megx metagranite	plg-qtz-kf	epg-bt	hn′-ap-tit	dk hn epg aft bt
450356	5351149	13	01LAH-0119	mpo hn, agg		metabasite	hn-plg	epg-wm(aft plg)	tit-qtz-op	wm aft plg postdates dominant texture
450286	5351578	22	01LAH-120b			intm metaclastite	epg-hn-qtz	plg-bt	cht-tit-op-to	w/ hn is this 73?
450279	5351706	73	01LAH-121a	laminated		fgr calcsilicate gnss	qtz-epg-hn-act-epg	tit	op-wm(aft plg)	mapped as mylonite; if so, blastomylonite
450279	5351706	13	01LAH-121b	mpo ll lyr		metabasite	plg-hn-qtz		tit-ip-epg	NB low epg, good fln
452865	5352837	32	01LAH-124	cren of mpo		metaultramafite	act-cht	cb	qtz-tit	ts too thick, litho uncertain
452855	5352670	41	01LAH-125	ipo wm, to	to?	wm-cht schist	qtz-wm-cht-plg?	cb	stp-to	open cren of wm + agg mpo
449449	5351880	12	01LAH-126			metaclastite	plg-qtz-act-hn-epg	cht (partly aft bt)	bt-tit-op	
449081	5352203	12	01LAH-133a	mpo ll lyr		mafic metaclastite	plg-2am-qtz-epg-cht	wm(aft plg)	op-tit	act+hn, thin lyr ll mpo(augen, hn, cht)
449081	5352203	62	01LAH-133b	mpo bt, agg	wwm	metatonalite	qtz-plg	bt	cht-tti-m/z-ap-prn?	bt in mpo, some cht aft bt, wm alt of some plg
452206	5352604	41	01LAH-145d	cren of ipo		cht-wm-cb phyllite	wm-qtz-cb	plg-cht	ru-op(cubes)	ipo = wm, agg
452328	5352786	42	01LAH-147	cren mpo ll lyr		cht-wm-bt phyllite	qtz-wm	plg-cht	bt-op	bt just getting going? rusty cht/wm?
451879	5352527	32	01LAH-148	mpo am		metaultramafite	cum/gru-cht		cb-tit-op-epg	epg concentr in cht-epg zn, not all am ll mpo
452025	5351894	32	01LAH-149	mpo am, agg		metaultramafite	am(clss)-cht(mg)	op		
452234	5351882	12	01LAH-150	mpo straight		metabasite	act/hn	plg	qtz-op-ap	wm aft plg near vn, very straight mpo
452626	5351450	31	01LAH-152	wpo ~ll lyr		metaultramafite	cht-cb-se-op			mostly cht on one side, cht-cb-se elsewhere
452777	5351629	22	01LAH-153	w-mpo agg		felsic metaporphyry	qtz-plg	bt-cht(aft bt)	epg(aft?), wm	could be felsic metavolcclastite
452691	5351862	13	01LAH-154	ipo hn, agg		metabasite	hn	plg-wm-tit	op	wm aft plg, epg? in straight vn cuts epg vn
447243	5349138	12	01LAH-167b	msv		metabasite(lampro?)	plg-bt-2am-epg	cht	tit-op-cb	ragged disequil txt, likely metalamp, chem?
446592	5350886	13	01LAH-171			mafic metabreccia	2hn	plg-epg-cht-op-tit		metabrx text, leuco zones, cgr hn + fgr hn agg
447483	5352177	21	01LAH-176			felsic metaclastite	qtz-fp	cht-tit-epg	op	epg but no wm or bt
447267	5349389	31	01LAH-182	cren mpo cht		cb-cht-wm phyllite	cht-cb	qtz-fp?-wm(tlc?)	op	crenulated mpo (wm, agg), metaumaf aft hall
447652	5349660	21	01LAH-185	m-ipo cht, agg		cht-cb metaclasite	plg-qtz-cht-cb	wm seams	op	enough cb for 71?
447665	5350360	71	01LAH-186b	cren mpo	cb?	cb-cht-wm phyllite	cb-cht	wm(tlc?)	op	could be metaumafite if wm=tlc check chem
447712	5350405	71	01LAH-186c	cren mpo wm	cb?	laminated wm phyllite	qtz-cb-wm		cht-op-to-tit?-m/z	cren in wm-rich lyrs, sub mm lyr
447695	5350315	11	01LAH-186e	cren ipo		metabasite	act-epg-cht	cht-plg	hn cores-op	hsz, am augen, in dk vfgr matrix(epg?)
447807	5350236	71	01LAH-198	cren ipo hsz	cb?	wm-cb-cht phyllite	qtz-cb-wm-plg-cht			crenulated hsz, po clearly hsz gsr

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
447805	5350273	71	01LAH-199	m-ipo agg	cb?	cb-cht phyllite/hsz	qtz-cht-cb	fp-op-tit(fuzzy)		chaotic txt, graphitic intergrow qtz, -ve fp
447351	5349665	71	01LAH-205	ipo s-c planes?	cb?	cb-cht-wm phyllite	qtz-plg-cb-cht-wm			cren ipo, s-c planes possibly, hsz
447746	5350781	21	01LAH-211	mpo, gsr		metaclastite	qtz-plg-epg?	cht-wm-tit(?)	op	hetero high strain fels rock
450017	5354811	72	01LAH-213	msv		metabreccia uncertain	qtz-epg-cht-tit		bt-hn-act	am partic patch, rounded tit!, litho uncertain
450857	5354106	71	01LAH-214	cren mpo		qtz-wm-cht-cb phyllite	qtz-wm-cb-cht	op		too much qtz for umaf, rusty cht
455755	5366329	21	01LAH-219a	wpo vfgr	wwm	felsic metavolcanic	qtz-fp-plg-kf?	cht-cb	wm-epg-op	wm seams/alt, cht very grn
455869	5366521	61	01LAH-219b	msv	mcb	meta-altd dyke	qtz-plg-cb-cht-wm		tit(fuzzy)-op	if dyke(hall) must be severely altd
455869	5366521	61	01LAH-220	msv		metatonalite	plg-qtz-cht-wm-epg	cb	op-tit	cht aft? wm-epg aft plg
455858	5365874	11	01LAH-221	msv		metabasite	plg-cht-cb-epg	qtz	tit-op	no act, pillow selvage
454147	5365747	21	01LAH-225	msv		metafelsite	qtz-plg-kf-wm(aft plg)	cht	stp-to	stp not bt, nice partly resorbed qtz
454202	5365378	21	01LAH-226	msv	cb?	metafelsite	qtz-fp-wm-cht-cb		m/z	more cht than 225, more clastic look
449556	5362905	11	01LAH-522a	mpo varioles?		metabasite	epg-plg-cht-act		qtz-op	qtz filled amygs
449556	5362905	51	01LAH-522b	msv		meta iron formation	qtz-mt-su-cht-un	stp		clearly sub am
448893	5363993	41	01LAH-528	ipo wm		qtz-wm phyllite	qtz-wm-op			too much qtz for umaf?
449187	5348524	61	01LAH-574	w-mpo		meta felsic intrusion	plg-qtz	kf-epg	bt-cht(aft bt)-wm	wm aft plg cores, moderate defm
449085	5348694	61	01LAH-576a	w-mpo bt, agg		metatonalite	plg-qtz	hn-cht(aft bt)-bt	tit-allanite?-ap	bt assoc with mpo, should be 62?
449085	5348694	61	01LAH-576b	mpo, gsr		metagranodiorite	plg-kf-qtz	cht(aft bt)	tit-ap	more defmd than 576a, qtz lenticles
452610	5350362	13	01LAH-602a	ipo hn, agg		mafic metaclastite/clsl	plg-qtz-hn	epg-wm(aft plg)	bt-tit	
479740	5357830	31	02LAH-009	mpo wm, cren		metaultramafite/malt	wm-cb	cht	op	po=wm wrapping cb augen, hope wm=tlc
478390	5363448	42	02LAH-013A	ipo cren		cht-wm-bt phyllite	cht-wm-cb-qtz	plg-op	bt-op-m/z	bt crenulated w/ cht-wm, localized in F2 flds
478392	5363455	22	02LAH-013B	mpo wm,agg		qf metaporphyry	plg-qtz-cht-cb	wm-op	bt-ru	bt with wm lenticles
478473	5364304	51	03LAH-018C	mpo cht,to,agg	to	chemical metased	cht-qtz-to	cb-wm-op		NB to, related to orig compo, cren of mpo
478499	5364130	71	02LAH-019	ipo s-c fabric?		metaclastite	2cb-qtz-cht-wm-fp		ru-op	rusty cht looks like bt, NB 2 cb, possible s-c
478565	5363705	51	02LAH-021	lyrd		meta-iron formation	op-un-qtz		cht	un is translucent red, high relief
480441	5366315	32	02LAH-033	lyr or vns		metaultramafite	am(clss)-cht-op-cpx	se?	wm?-bt?	cpx looks metamorphic, if so 73 applies also
478021	5361711	12	02LAH-048D	msv am vn		metabasite	2 am-epg-cht-plg		qtz-tit-op	act aggreg aft phenos cut by am vn
478046	5361701	12	02LAH-048F	msv		meta-altd intm porphy	epg-qtz	act-amr	tit	qtz-rich zone=premeta silic?, high epg=malt?
477968	5361538	12	02LAH-048G	msv		intm metaclastite	plg-qtz-2am-epg-wm	cht	op-tit	check 2 am, NB epg vein, mafic clasts
480010	5361901	12	02LAH-058	msv		metabasite	act-hn-epg-plg	wm(aft plg)	tit-op	heterogeneous rk, but msv
480300	5363636	11	02LAH-064	ipo cht,am,agg		mafic metaporphyry	plg-at-cht-epg-qtz?	cb	tit-kf	kf-cht, some am needles random orientation
480371	5363886	51	02LAH-066	bdg		meta iron formation	qtz-op-un-hematite		cb(rusty)-cht	rusty cb w/ qtz, magnetite
480225	5364017	22	02LAH-070	mpo cren		felsic metaclastite	plg-qtz-wm	cht-cb	bt-ru	crenulation of main fabric,
480794	5363420	72	02LAH-083	mpo agg		intm metavolcanic	plg-cht-cb	act-tit		act-cb-rich blebs, cb augen
480980	5361695	21	02LAH-092C	mpo		felsic metasediment	qtz-wm-cht-cb		to-m/z-op	NB to, rusty cht looks like bt
480935	5361600	31	02LAH-093	msv op vn		metaultramafite	se-cb-op			wm radiating from seams of op
480201	5361370	11	02LAH-096	msv		am-plg metaporphyry	plg-act-wm-epg	cht-qtz-tit		ex hn phenos to act aggreg, plg to epg agg

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
481190	5364394	21	02LAH-108B	mpo wm,cht		felsic metatuff	wm-qtz-cht-plg	plg?	un-m/z	too fgr to verify plg, rusty wm not bt
482911	5365895	41	02LAH-129C	mpo wm,cht		wm-cb-cht phyllite	wm-cht-qtz-plg	cb(vn, augen)	rusty cht-op	rusty cht-wm not bt
483521	5364065	21	02LAH-147A	mpo cht		cht metatuff	plg-cht-qtz	cb aft plg, matrix	wm (in plg)	poorly sorted, vfgr matrix
483465	5360967	21	02LAH-172	msv		wm-cb-cht mclastite	qtz-plg-wm-cb	cht	op-to-m/z	wm-cb-cht aft plg
482539	5356585	21	02LAH-173A	m-wpo wm agg		metaclastite	plg-qtz-wm-cb		op	rusty wm-cht or bt again but not convincing
482540	5360665	71	02LAH-173B		cb?	metaclastite	qtz-cb-cht	wm-plg	op	relict ign txt possible, cb = alt or primary?
483253	5357826	21	02LAH-175	qtz-cb vn		metaclastite	plg-qtz-cb-cht-wm		op-ru-m/z	looks like less cht close to qtz-cb vein
477340	5366771	11	02LAH-183A	wpo cht agg		metabasite	cht-plg-epg-act	qtz	cb-tit-op	cht agg like cht lenticles at Camp Caiman SA
477355	5366768	11	02LAH-183B	mpo cht, agg		cht phyllite/metatuff	cht-qtz-plg-cb	tit-cb	op	lots of rusty cht no bt, possible hsz
482706	5363924	41	02LAH-666B'	mpo, defmd vn		cht-wm phyllite/mtuff	cht-wm-qtz-plg?		op-cb-ru	the rusty cht-wm judged not to be bt
482706	5363924	41	02LAH-666B"	mpo + cren		cht-wm-cb phyllite	cht-qtz-wm-plg?	cb(rusty, poiks)	ru-rusty cht	cb porphyroblast,
601526	5355557	11	03ASP0003.1.1	msv		metabasite	plg-epg	cb-cht	op-wm-tit-qtz	cb amygs, no act
599179	5354866	11	03ASP0015.1.1	msv		metabasite	act-cht-epg	plg(most to epg)	op	some very acic am in cht amygs
599179	5354866	11	03ASP0015.2.1	msv		metabasite(intm)	plg-act-epg-cht	qtz-tit	op	
596388	5348979	11	03ASP0016.1.1	msv		metabasite(intm)	epg-cht-act	plg-qtz	op-tit	why intm? Is it the qtz?
596754	5348631	10	03ASP0020.1.1	wpo agg	cb?	intm metavolcanic	plg-epg-cht-cb	tit?	op-wm	vfgr ID uncertain, mcbalt?
594816	5349260	21	03ASP0027.1.1	mpo fp-qtz		metafelsite	fp(-ve)-qtz	cht	epg-cb	ign fp fln?, no wm, eu epg aft fp phenos
594701	5349004	21	03ASP0028.1.1	wpo wm		fels/intm metavolcanic	fp-qtz-cht-wm	epg	op	vfgr, mineral ID uncertain
594701	5349004	11	03ASP0028.3.1	msv		metabasite(intm)	epg(brnish)-plg	cb-cht	qtz-op-?tit?	cb in amygs + matrix, what is tit-like mineral?
600235	5339147	10	03ASP0030.1.1	msv		metabasite	plg-act-epg-cht	un(vfgr, brn)-op		not typical gz rk, very "fuzzy", un has +ve rel
600175	5339597	11	03ASP0033.1.1	msv epg vn		metabastite(intm)	plg-act(blgrn)	hn'-epg-cht	tit	messy texture,
596611	5350634	10	03ASP0040.1.1	wpo fp(ign fln?)		am-plg metaporphyry	plg-fp-epg(brn)	am'-cht-qtz-un	cht-op	un(aft plg) has 1-2° biref, lengh fast
596858	5350588	10	03ASP0041.1.1	msv		fels/intm metaporphyry	plg-epg	cht	wm(aft plg)	epg in matrix + aft plg, qtz too low for felsite
599285	5345294	10	03ASP0043.1.1	msv		metabasite(intm)	epg(brnish)?	tit?-plg	qtz-op	zoned amygs, cht core fgr rjms of ?, no cb
599340	5345293	21	03ASP0044.1.1	msv		intm plg metaporphyry	plg-epg-wm-kf?	cht	op-tit?-ap	not felsic rk, heterog, wm-epg aft plg
599477	5345342	10	03ASP0045.1.1	msv		intm fp metaporphyry	plg	pu-epg-cht	qtz	at last, unequivocal subgreenschsit grade rx!
596789	5340101	10	03ASP0048.1.1	msv		metabasite	plg-epg-cht	pu-cb	op	seams, blebs of pu, pu also in cht blebs
596789	5340101	10	03ASP0048.3.1	msv		metabasite	cpxr-plg-epg(brn)	qtz-cht	op-tit	no act
597117	5339960	10	03ASP0052.1.1	msv		metabasite	cpxr-cht-tlc?		op-pu-qtz	tlc uncertain, check pu
597210	5340023	10	03ASP0053.2.1	msv vn/hsz	m cb	metabasite	plg-cht-cb	epg		NB pu-prn-epg vein or hsz, pre/syn-meta cbalt
596511	5350770	20	03ASP0058.1.1	msv		metafelsite	fp-qtz-plg-wm	epg(aft plg)-cht	op-pu?	pu? In plg phenos, possible subgreenschist
596399	5350739	21	03ASP0059.2.1			metafelsite	plg-qtz-wm	cht		more mafic than BH's felsic rx, 20 possible
600144	5340608	11	03ASP0064.2.1	msv, epg vn		metabasite	act-cht-epg-plg	qtz	op	
600548	5354770	21	03ASP0068.1.1	msv	mwmcb	intm metaclastite	fp-qtz-wm-cb	cht	op	moderate pre/syn-metamorphic wm-cb alt
599899	5354039	11	03ASP0071.1.1	msv		metabasite	act-epg-cht	plg	op-tit	
599600	5353590	21	03ASP0075.1.1	msv	m wm	metafelsite	fp-qtz-wm	cht	op-cb	rather cht-rich for felsite, alt=pre/syn meta

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
599967	5344587	21	03ASP0078.1.1	msv		mafic metatuff	epg-cht	wm-cpx′	op-tit(fuzzy brn)	two chts, blue biref and gry birefringence
600061	5344582	11	03ASP0083.1.1	mpo agg		intm metatuff	epg-cht-plg-qtz	tit		NB reiict glassy textures, no act
600061	5344582	11	03ASP0083.3.1	hsz gsr		metabasite	act-cht-epg	cpxr-wm-tit?	op	defmd rk, grain size reduction, hsz?
600012	5353297	21	03ASP0087.1.1	mpo agg		felsic metaclastite	plg-qtz-wm-cht(olgrn)		op-m/z	some rusty cht looking like bt
600078	5340761	11	03ASP0093.1.1	msv polygd vn		metabasite	epg-act-cht	qtz	op	qtz in amygs, polygonized qtz vein
600639	5341436	12	03ASP0094.1.1	msv	w wm	metabasite/diorite	hn-plg	cht-act-op-wm	epg-tit-ap-cb	wmalt of plg/mafic inclusion, act core hn rim
597287	5347195	11	03ASP0100.1.1	msv		metabasite(itnm)	epg-cht-plg	qtz	tit-op	vfgr mineral ID uncertain, no act obvious
597447	5347377	11	03ASP0102.2.1	msv	iwm	intm metaporphyry	epg-cht-wm	plg(matrix)-qtz	hn′	iwmalt of plg phenos
597415	5347463	10	03ASP0104.1.1	msv		intm metavolcanic rk	plg-epg-cht-tit?	un(prn?)	op-m/z-wm	wm aft plg, un length fast clss mica-like?
597406	5346947	10	03ASP0107.1.1	msv		intm metaporphyry	plg-cht-epg		qtz-ps-op-tit	ps is brn, tit?fuzzy, vfgr mineral ID uncertain
597870	5350474	21	03ASP0109.1.1	wpo wm agg	w wm	intm metaclastite	plg-qtz-wm	cht-cb	op	iwmalt if this is meta-andesite
598428	5350747	21	03ASP0115.1.1	wpo wm, agg		metaclastite	qtz-fp-wm	cht-cb	op	possibly <21, fuzzy look, vfgr
599532	5353404	21	03ASP0121.1.1	mpo, gsr, polyg		felsic metaclastite	qtz-fp-cht		wm-op	possibly <21, fuzzy look, vfgr, intense defm
599532	5353404	20	03ASP0121.2.1	fractured		felsic metabreccia	plg-qtz	cht-cb	epg-op	low grade defm, fractured
601016	5351781	10	03ASP0124.1.1	msv		metabasite	plg-un-qtz	tit-cht-epg	cb	un=inclined extinc, length fast, low biref
600509	5351760	10	03ASP0125.1.1	msv		metabasite	plg-cpxr	cht-epg-wm-qtz	op	birefringence low for epg
600515	5351813	20	03ASP0126.2.1	mpo, ign?		intm/fels metaclastite	plg-epg?		op-cht	quite mafic for felsite, un is subgz mineral?
593446	5350654	20	03ASP0130.1.2	msv	cbwm	intm/fels metaclastite	fp-qtz-cb-wm-cht	epg?	op-m/z	cbwmalt pre/syn meta, biref is low for epg
593446	5350654	10	03ASP0130.2.1	msv		metabasite(intm)	plg-qtz-cpx′-epg?	am-un	op	acic am?, some ll extinction
593446	5350654	10	03ASP0130.4.1	msv		metabasite(intm)	plg"-epg?-cht-un	cpx′-qtz	op	low biref un aft plg is -ve to cht
593528	5350685	20	03ASP0131.1.1	msv		maf/fels metaporphyry	fp-qtz-cht-epg?	cb	op-tit	spectac resorb of qtz, too much cht for felsic
593276	5350764	20	03ASP0133.1.1	msv		metafelsite(dacite?)	plg-qtz-cht-kf?	epg	opo-tit?-ap	too much cht for felsic rk
593510	5350992	10	03ASP0134.1.1	msv		metabasite(intm)	plg-cht-epg	un	op-m/z-tit	wm-like but length fast = prn?
595310	5352465	20	03ASP0135.1.2	msv	wmcb	metafelsite	fp-qtz	cht-cb-wm	op	wm-cbalt pre/syn-meta, cht too much for fels
595218	5352837	20	03ASP0137.1.1	msv		intm metavolcanic rk	epg?-cht	op-tit	wm?-op	too much cht for felsic rk, biref for epg low
594806	5352965	20	03ASP0141.1.3	msv	wmcb	metafelsite	fp-qtz-wm-cht-cb		op	
595486	5354252	10	03ASP0142.1.1	msv	wwm	metabasite	plg-cht-wm(aft plg)	epg-qtz-tit?	op	
595645	5354339	20	03ASP0143.1.1	msv		dacitic metatuff	plg-qtz-cht-epg	kf	op	2epg, yel to clss, almost isotropic
595551	5354159	20	03ASP0144.1.2	msv		felsic metaclastite	fp-qtz-wm-tit(brn)?	cht-epg	op	
595872	5353798	10	03ASP0145.1.1	msv		metabasite(intm)	epg?-cht-epg	cpx′-un	wm-op	un like am but ll extinct, brn semi-isotrop epg?
599323	5352512	20	03ASP0146.1.1	mpo wm, agg	cb?	metafelsite	fp-qtz-wm-cb		op-cht	is cb alt or primary?
599323	5352512	71	03ASP0146.3.1	msv	cbwm	meta-cbaltd intm/basite	plg-cht-cb-wm	op		mod cbalt and wmalt of plg
599365	5352135	21	03ASP0147.1.1	mpo wm		metafelsite	plg-qtz-wm-cht		op	wm-cht in matrix, cht-wm pseudos aft ?
599365	5352135	21	03ASP0147.2.1	mpo wm, cht	iwm	intm metaporphyry	fp-cht-wm	qtz	op	intense wm alt, pre/syn meta
599882	5341795	10	03ASP0149.1.1	msv		metabasite/intm	plg-cht-pu?	qtz	tit?	subgz ifbrnish epg-like mineral is pu
599694	5342260	10	03ASP0152.1.1	msv		metabasite	un(pu?)-epg?	cht	tit-op	un=low bir (yl-rd), stubby prismatic, incld extin

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
599436	5342900	10	03ASP0154.1.1	msv		metabasite	cht-epg?-un		cb	
599296	5343755	10	03ASP0157.1.1	msv	wm	metabasite	epg?-cht-wm-"plg"	cpx'-qtz		wmalt of plg, unsure about epg
599240	5351417	10	03ASP0159.1.1	msv	icb	metabasite(amygs)	cb-cht-plg"-qtz			intense wm alt, pre/syn meta, round qtz amygs
599091	5351293	20	03ASP0162.2.1	msv		dacitic? Metafelsite	plg-wm-cht	qtz-cb	op-m/z	more cht than typical of metafelsites
599061	5351237	21	03ASP0163.3.1	mpo wm, agg		intm/fel metaclastite	fp-qtz-cht-wm-cb			cb amygs
598893	5351361	20	03ASP0164.1.1	wpo cht, agg		intm metavolcanic rk	plg-cht-qtz	wm-cb	op	could be less than 21 cannot say for sure
598893	5351361	20	03ASP0164.4.1	mpo plg, agg		intm/fels metaclastite	plg-cht-qtz	cb	op	plg defines in part the mpo!, is it ign po?
599046	5352817	10	03ASP0166.1.1	wpo agg		metabasite(intm)	cht-plg"-qtz	wm	epg-tit?	
599293	5353039	20	03ASP0170.1.1	msv		metafelsite	fp-qtz-wm	cht-cb		could be less than 21 cannot say for sure
599463	5353167	20	03ASP0175.1.1	msv		metafelsite	fp-qtz-wm	cht-cb		
599828	5352946	20	03ASP0176.1.1	msv		metafelsite	fp-qtz-wm		cht(scarce)	fp in matrix and as phenos
599636	5352799	20	03ASP0179.1.1	msv	m cb	metafelsite	fp-qtz-wm	cb	cht	moderate cbalt of plg phenos and matrix
599419	5351732	71	03ASP0183.2.1	msv	cbiwm	meta-altd basite	wm-cb-plg	cht	op	intense wmalt, mod cbalt, pre/syn-meta
599362	5351925	71	03ASP0184.1.1	msv	icbwm	meta-altd basite	wm-cb-plg-cht	op		intense wmalt and cbalt
599196	5352584	20	03ASP0187.1.2	ipo wm		metafelsite	fp-qtz-wm	cht		poor thin section, rusty wm-cht not bt
598642	5352500	70	03ASP0191.1.1	msv	wmcb	metabasite(intm)	fp-qtz-wm-cb	cht	op	moderate wm and cb alteration, assume 70
596765	5345233	20	03ASP0198.2.1	msv		metafelsite	fp-qtz-cht	cb-wm		most wm aft plg
598362	5346281	20	03ASP0200.1.1	msv		metafelsite	plg-qtz	wm-cht-cb		
598292	5346311	10	03ASP0201.1.1	msv		metabasite/intm	epg?-cht-plg-wm	qtz	tit?	intense wmalt, pre/syn-metamorphism
598292	5346311	10	03ASP0201.2.1	msv	wm	metabasite/intm	plg-qtz-cht-epg	wm-cb	op	cb-wm pseudos aft ?
598153	5346218	20	03ASP0203.1.1	msv		felsic metaporphyry	plg-qtz	wm	epg-cb-op-ap	
598034	5345624	10	03ASP0205.1.1	msv		metabasite/intm	plg-epg?-un	wm		
598826	5351143	70	03ASP0207.2.1	msv		metafelsite	fp-qtz-wm-cb-cht			71/21 or lower?, cb blebs aft?, or amygs?
597916	5352132	11	03ASP0209.2.1	msv		metabasite/intm	plg-epg?-cht-act	tit?(fuzzy brn)		
597964	5352187	10	03ASP0210.1.1	msv		metabasite/intm	plg-cht-epg	tit?	op-wm-cb	
596846	5340279	10	03ASP0212.1.1	msv	cb	metabasite	cb-cht	plg	epg-qtz	why not 71 or lower
453595	5371331	21	03-BHA-0019B	mpo wm, agg		felsic xl metatuff	wm-qtz-fp		cht-cb-m/z	defmd polygd qtz vn
453939	5371198	21	03-BHA-0022A	mpo wm, agg		felsic metaclastite	fp-qtz-wm		cht-cb-op-m/z	rusty seams
453795	5371180	21	03-BHA-0023A	mpo wm, agg		felsic metaclastite	qtz-fp-wm		cb-cht-m/z	a few grains cht only
453662	5370879	21	03-BHA-0027	wpo fldd qtz vn		felsic metaclastite	fp-qtz-wm		cht-cb-op	folded polygonized qtz vein
454055	5370932	21	03-BHA-0031C	wpo wm, agg		metafelsite	fp-qtz-wm	cht	cb-op	prominent resorbtion of qtz
452827	5368818	21	03-BHA-0053B	mpo wm, clasts		felsic metatuff	fp-wm-qtz		cht-op-cb	
453152	5368612	22	03-BHA-0064	mpo cht, wm		felsic metatuff	wm-fp-qtz	cht	bt-op-m/z	very green cht, aggregates also define mpo
453235	5368368	21	03-BHA-0066A	mpo cht, wm		felsic metatuff	plg-qtz	cht-wm	op-m/z-bt'?	relict ign bt is possible here
452637	5368575	21	03-BHA-0074	wpo cht, agg		felsic metatuff	fp-qtz	wm-cht	op-cb-m/z	wm defines mpo also
453586	5367545	21	03-BHA-0088C	mpo wm, agg		felsic metatuff	fp-qtz-wm		cht-op-cb-m/z	

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
453385	5367303	21	03-BHA-0090	mpo wm, agg		felsic metatuff	fp-qtz-wm		cht-cb-op-m/z	cb is rhombic
454309	5366973	21	03-BHA-0113C	mpo wm, agg		felsic metaclastite	plg-qtz-wm	cht	op-zi	so much cht, wm = volcaniclastite?
454265	5369714	21	03-BHA-0116A	wpo cht, agg		felsic metaclastite	plg-qtz	cht-wm	op-cb-m/z	cht is prominent
454258	5369648	21	03-BHA-0116B	msv cb-qtz vn	mwm	metafelsite	fp-qtz-cht-wm	cb	op-zi	wm alt is premeta, cb-qtz vns polygd
458910	5367060	22	03-BHA-0122	msv		metafelsite	plg-qtz	wm-bt-cht	op-cb-zi	bt>>cht
458677	5367381	22	03-BHA-0125A	msv	iwm	metafelsite	fp-qtz-wm	bt	cb-op-ap	plg alted to wm, bt as aggregates and grains
458631	5367369	22	03-BHA-0125B	bt-cht seams		metafelsite	fp-qtz-wm	bt-cht(aft bt)		cht-bt random seams, bt "stylolites"? 22+21
458048	5366635	22	03-BHA-0131A	wpo wm, agg		metafelsite	plg-qtz-wm	bt	cb-op	cb clots, bt after+with cb
455759	5366364	21	03-BHA-0133	msv	wcb	metafelsite	plg-qtz	wm-cht-cb	op-zi	cb alt of plg
459508	5366611	21	03-BHA-0137	mpo wm, agg		metafelsite	fp-qtz-wm	cb	cht-op	
459595	5367140	22	03-BHA-0141	msv		felsic metaclastite	plg-qtz-wm	bt	cht-op	bt and cht not overlapping, discrete grains
459536	5367175	21	03-BHA-0144A	wpo wm, agg		metafelsite	fp-qtz-wm	cht+un agg	op	cht+un aggregates after mafic mineral?
459536	5367175	21	03-BHA-0144C	msv		metafelsite	plg-qtz-wm	cht-cht+cb-b'r?	op	aggs ex am possibly, rhombic shape
457551	5367614	22	03-BHA-0149	msv		metafelsite	plg-qtz	wm-bt	cb-op-cht	
455101	5369907	22	03-BHA-0160B	wpo wm		metafelsite	plg-qtz-kf?	wm-bt	cb-op	
456756	5369015	22	03-BHA-0171A	msv qtz-cb vn		metafelsite	fp-qtz-wm	cht(mg)	cb-op-bt-m/z	22+21 or bt is ign, some cht aft bt, m/z prom
456225	5369091	21	03-BHA-0172A	wpo wm, agg		felsic metaclastite	fp-qtz-wm	cht-cb	op	again subhedral cht-cb aggs (was am?)
455972	5368980	21	03-BHA-0175	msv		felsic metatuff	plg-qtz-wm-cht		cb-op-zi	cb blebs inside plg phenocrysts/crystals
454673	5369935	22	03-BHA-0179	msv bt veins		metafelsite	fp-qtz-wm	bt	cb-op-cht	NB bt "veinlets"
455017	5369438	22	03-BHA-0187	msv bt veins		metafelsite	qtz-fp-wm	bt	cjt	
455689	5371419	21	03-BHA-0198	mpo cht, agg		felsic metaclastite	fp-qtz-cht	wm	op	
455546	5371150	21	03-BHA-0203D	mpo agg, cht		lapilli metatuff	plg-cht-wm	cb(rusty)	op-m/z-ru	
455186	5370850	21	03-BHA-0213	wpo wm, agg	wm	felsic metatuff?	wm-plg-qtz-cht		op-cb(rusty)	wmalt of rhyo likely pre/syn-metamorphism
455084	5370850	21	03-BHA-0216B	mpo wm, agg		felsic metaclastite	fp-qtz-wm-cht		zi-op	
455181	5371108	21	03-BHA-0218	wpo wm, agg		felsic metatuff	fp-qtz-wm-cb (eu, rus)	cb(not rusty)	op-zi-un	rusty cb is euhedral, isotropic red un
459951	5365830	21	03-BHA-0227A	mpo wm, clasts	?	felsic metaclastite?	fp-qtz	wm-cht		if rhyo, rk is much alted defmd, wm in seams
459673	5365833	21	03-BHA-0229A	mpo wm, agg		felsic metaclastite	qtz-plg-fp-wm		zi-op-cb	folded polygonized qtz vein, cht also in mpo
455916	5370613	21	03-BHA-0233	mpo wm, agg	?	felsic metaclastite	fp-qtz-wm	cht	cb(rusty)	wmaltd + defmd if rhyo
458218	5371414	21	03-BHA-0248	msv wpo wm		metafelsite	fp-qtz	wm-cht	op-m/z-cb	
456736	5370919	21	03-BHA-0267	mpo wm, agg		felsic metaclastite	fp-qtz-wm	cht	cb-m/z-op	some cht-cb aggregates
457366	5372216	21	03-BHA-0281	mpo wm cht		metafelsite	plg-fp-qtz-wm	cht	cb-op	cb porphyroblasts, clear rims, defmd qtz vn
454290	5365359	21	03-BHA-0289	mpo cht, agg	mwm	felsic metaclastite	qtz-plg-fp-cht-wm		op-cb-zi	somewhat coarsely rexl, wmalt of plg
454220	5365402	21	03-BHA-0290	m-wpo wm agg	mwm	felsic metaclastite	plg-qtz-wm	cht	op-m/z	wmalt of plg, pleo halos in cht, wmalt of plg
454301	5365641	21	03-BHA-0291	wpo wm vn	mcb	metafelsite	plg-qtz-wm	cb(aft plg, eu, vn)	stp	defmd cb-stp vn, cb in three forms, NB stp
454161	5365591	21	03-BHA-0293	mpo wm, agg		metafelsite	fp-qtz-wm	cht	op-cb	much of cht assoc with op
454129	5365730	21	03-BHA-0294	mpo wm, agg		felsic metaclastite	plg-qtz-wm	cht	stp-op-m/z	21 with stp

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
454528	5365911	21	03-BHA-0297A	impo wm, clasts		felsic metatuff	plg-qtz-fp-wm		cht-cb(rusty)-op	rusty cht looking like bt, fldd qtz vn
458446	5368962	71	03-BHA-0301	msv	icb	metabasite	plg-cht-cb	tit	op-qtz	cbalt of mafic rk, pre/syn metamorphism
458085	5369178	21	03-BHA-0307B	msv		metafelsite	plg-qtz	wm	op-cht	op as discrete grains + porphyroblasts
455608	5367765	21	03-BHA-0308	msv		metafelsite	plg-qtz	kf-wm-cht	op-m/z	
454332	5369275	22	03-BHA-0312	wpo agg		felsic metatuff	qtz-plg-cht-wm	bt	cb-m/z-op	bt aggs aft ?, plg partly gone to wm, cht aft bt
454344	5369384	21	03-BHA-0314B	folds		felsic metatuff	plg-qtz	wm-cht	ap-m/z-op	spectacular ign texture, folds
455858	5365869	11	03-BHA-0317	msv	mcb?	metabasite	plg-cht-cb	op-ru		possibly cbaltd metabasite (71), no act
455602	5365928	11	03-BHA-0320	msv	wcb	metabasite	epg-plg-cht	cb(vn, matrix)	op-tit	epg in vn + matrix as is cb, no act
455789	5366128	22	03-BHA-0326	msv	iwm	metafelsite	plg-qtz-wm	bt	cb-op-m/z	bt random orientation, iwmalt of plg
455754	5366414	21	03-BHA-0327	msv		metafelsite	plg-qtz-wm	cht-cb(vn, matrix)	op	seams of wm, polygd qtz-cb vn
456491	5365457	11	03-BHA-0332	msv		metabasite	plg)-cht-tit	cb-qtz	op	ch-wm-cb also = 21, wm aft plg, no act
454049	5366492	21	03-BHA-0339	w-mpo wm, ag		felsic metatuff	fp-qtz-wm		cht-cb-op	some cb is rusty
458475	5369487	21	03-BHA-0345	mpo wm, agg		felsic metatuff	qtz-plg-wm	cb(euhedral)	cht(mg)-zi-op	NB cb rhombs
457015	5371318	21	03-BHA-0354	msv dfmd qtz vn		metarhyolite	fp(-ve)-qtz	wm-cht	cb (porphyro)-to	cht rosettes, cb-cht-to "stylolites", defmd vn
457437	5371370	21	03-BHA-0358	msv		metafelsite	fp(-ve)-qtz-wm		cjt-cb(euhral)-zi	rusty seam, euhedral cb
459594	5366499	21	03-BHA-0363	msv		metafelsite	fp(-ve)-qtz-wm		cht-cb(blebs)-zi	
458486	5366357	22	03-BHA-0365	mpo wm, agg		felsic metaclastite	fp-qtz-wm	cht(grn)-bt(olbrn)	cb-op-m/z	some bt, cht not ll mpo, cht + bt stable
457831	5366012	22	03-BHA-0368	wpo wm, agg		metafelsite	fp(-ve)-plg-qtz-wm	cht-bt	op-m/z-cb	cht + bt both stable
457774	5365887	22	03-BHA-0373	wpo wm, agg		felsic metatuff	plg-qtz-wm	cht-bt-cb	op	bt very brn, cht very grn,
457698	5365882	21	03-BHA-0374A	mpo wm, agg		felsic metatuff	plg-qtz-wm	cht-cb		rusty seams, cb in part euhedral
459036	5371247	71	03-BHA-0379	msv	icb	metabasite	cht-cb-plg	wm-qtz-op		cbalt of mafic rk, pre/syn metamorphism
459116	5371051	11	03-BHA-0380B	msv		metabasite	cht-epg-plg	act-op	tit	act as very fine prisms,
455853	5381788	22	03-BHA-0384	msv		fels/intm metatuff	plg-qtz	act(grn)-bt	tit	22, bt with act, too pale for hn
459689	5371168	21	03-BHA-0387	msv	mcb	intm metaclastite	cht-plg-qtz-cb	op-ru	wm-tit	could be 71 also
459509	5371440	21	03-BHA-0394	wpo agg, cht		felsic metatuff	plg-qtz-cht	cb-wm	op	wm also defines wpo
457945	5370599	21	03-BHA-0402	mpo wm, agg		felsic metatuff	fp-qtz-wm-cb		cht-op-ru	some euhedral cb,
458115	5370698	71	03-BHA-0407	msv-wpo cb vn		metabasite(maltd)	cht-cb-plg	qtz-ru	wm	wm+cht=21 also, maltd basite, cb veins
453978	5371421	21	03-BHA-0414	mpo agg	wmcb	metafelsite	wm-fp-qtz	cb-cht		wmalt of plg, cbalt, some cb euhedral
453765	5371904	21	03-BHA-0415D	mpo wm, agg	iwm	felsic metatuff (lithic)	qtz-wm-fp		cb-cht?-op	cht uncertain
458149	5369649	22	03-BHA-0418B	wpo agg, wm		felsic metatuff	qtz-plg-wm	cht-bt	cb	bt OK, could be rellict, rusty seams look like bt
453920	5371780	21	03-BHA-0423	mpo wm, agg	iwm	felsic metatuff	qm-fp-qtz		cb(euhedral)-cht	
460180	5369869	21	03-BHA-0444	wpo agg		felsic metatuff	fp-qtz-wm	cht	op-ap-m/z-epg	
452981	5372017	21	03-BHA-0449	wpo-mpo,agg	mwm	felsic metatuff	plg(-ve)-qtz-wm		cht-op	moderate wm alteration of plg
452951	5372120	21	03-BHA-0451	mpo agg, wm		fels metaclastite/rhyo	plg-qtz-wm	cb(euhedral)	cht-op	spherulitic, polygd qtz-fp(-ve) vn
454245	5371603	21	03-BHA-0463	mpo wm, agg		metafelsite	fp-qtz	wm-cht-cb	op-zi	
459499	5371323	71	03-BHA-0474	msv	mcb	intm metaclastite/volc	cht-cb-plg	tit	op	meta-altd basite

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
485630	5366314	21	03-LAH-0005A	mpo		mafic metaclastite	plg-qtz-cht-cb	epg-wm	tit	
485833	5365212	21	03-LAH-0013B	msv		mafic metaclastite	cht-plg-qtz-cb	wm	op	qtz cb wmb grains in vfgr cht-plg-qtz matrix
487108	5363833	11	03-LAH-0034A	defmd vein		metabasite	act-plg-qtz	epg	tit	qtz amygs, cht rims, a lot of qtz, intm?
485116	5364066	21	03-LAH-0041A			mafic metaclastite	cht-plg-wm	epg-cb	ru	spectacular rutile prisms
488382	5364933	21	03-LAH-0078B	msv		mafic metaclastite	cht-plg-epg-qtz	cb	tit	
489924	5365616	32	03-LAH-0080A1	msv		metaultramafite	am-cht		cb-wm(tlc?)	wm likely talc
490767	5365650	21	03-LAH-0109A	mpo, S_M, S_L c-s		felsic xl metatuff	plg-qtz-wm	cht-epg		epg just getting going, P shadows, c-s ?
491729	5363917	11	03-LAH-0118A	msv		intm metaclastite/flow	plg-qtz-act	epg-cht	tit	lots qtz, uncertain if intm mclte or metavolc
491859	5364104	21	03-LAH-0121C	wpo	wprem K	felsic metclastite	plg-qtz-wm	cht-cb	op	wm distrib = m prem K alt?, cb-wm seams
491265	5363298	21	03-LAH-0127A	wpo		mafic metaclastite	plg-qtz-cht-wm	epg-cb	op-tit	could be 71 or 11(no act)
491954	5363860	11	03-LAH-0130A	msv		metabasite	plg-act	cht-epg-qtz	op	
490792	5363576	11	03-LAH-0132A	msv		metabasite	cht-cb-epg-wm	op-qtz-plg		most plg to wm and/or cht, lgz for sure, 71?
490415	5363276	21	03-LAH-0134A1			mafic metaclastite	plg-cht-qtz-cb	wm		fe rims on cb, definitely sub bt grade
493476	5362615	71	03-LAH-0161	m-wpo cht agg		cht-wb-wm fels mclste	plg-qtz-wm-cb	cht	epg-op	cb grains more like clasts than porphyroblasts
493472	5362617	21	03-LAH-0161A	msv qtzcb vn		metafelsite	plg	epg-op-qtz	cb-cht-op-tit	
493495	5362903	71	03-LAH-0163A		prem cb	mafic metaclastite	cht-plg-qtz-cb	wm	op	signif cbalt before/during meta
492977	5363405	51	03-LAH-0167A	lyrd		meta-iron formation	qtz-op	cb	cht	qtz cb used to estimate grade
492460	5362399	72	03-LAH-0177A	crudely lyrd		intm/mafic metaclastite	plg-qtz-act	cht-cb	epg	am randomly oriented, could take as 11
489335	5365618	11	03-LAH-0182A	mpo		metabasite	plg	cht-cb	epg-bt′	cht grn to pale brn pleochroism
487296	5351597	31	03-LAH-0205A	msv		metaultramafite	cb-se	wm(tlc)	op	
488275	5352377	21	03-LAH-0210A	wpo		intm metaclastite	wm-cht-epg?-qtz	op		epg fuzzy, cm scale clasts?
487195	5351404	41	03-LAH-0213B	mpo		cht-qtz schist	cht-wm-qtz		tit-op-epg	watch out for rusty cht looking like bt
487675	5352150	32	03-LAH-0225A1	msv		metaultramafite	tlc-cht-am	op		still lots of tlc + cht, am is colourless
493664	5358997	11	03-LAH-0233A			metabasite	plg-cht-wm	cb	epg	no act, too fgr for good ID, no bt=21?
493664	5358997	21	03-LAH-0233B			metafelsite	plg(-ve)-qtz	wm-cb-cht		cb has rusty edges,
493647	5358562	71	03-LAH-0235A	wpo	m wm	felsic metaclastite	wm-qtz-cb-cht	plg	op	wm pseudos aft plg?, wmalt premeta?
494316	5358774	71	03-LAH-0239C	wpo		cb-cht schist/mumaf	cb-cht	plg/qtz?	op	two cb (lge rusty edges, sml euhedral, 31?
494180	5358856	11	03-LAH-0240A		m cb	metabasite (cbaltd)	cht-plg-epg	cb-wm	ru	spectacular ru, cb poiks preserve orig txt PO
488512	5351161	53	03-LAH-0245A	wpo, lyrd		meta-iron formation	qtz-op-gru	cpx		cpx in partic lyr (originally Ca-rich?)
480999	5350169	61	03-LAH-0501A	msv		metagranite	kf-plg-qtz	bt-hn-epg-cht	act-tit-zi	cht-epg-act aft hn, cht aft bt, epg-wm in plg
478637	5353516	61	03-LAH-0513A	msv		metagranite	kf-plg	qtz-hn-epg-cht-bt	tit-ap-m/z-op	epg-cht-act aft?, < metad than 501A, cht aft bt
482689	5355654	32	03-LAH-0528A2	msv		metaultramafite	am(clss to plgrn)		cht-tit-op	a lot of am, random, signif extinction angle
482689	5355654	31	03-LAH-0528A1	msv		metaultramafite	tlc-se	cb-op		platey se?, cb as vfgr aggreg, TS too thin
482537	5356542	21	03-LAH-0532A1			fel/intm metaclastitte	plg-qtz-epg-wm	cb-cht	tit	wm cht separated by epg, clastic texture
482456	5356165	71	03-LAH-0536A1	wpo		cb-qtz-cht rock	cb-qtz-cht		op	blocky cb rusty edges, euhedral cb not rusty
479825	5355823	21	03-LAH-0546A	mpo	w cb	intm metaclastite	plg-qtz-wm-cb	cht-epg	op-tit	prem cbalt, cb clasts also, 71 possible

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
480814	5356651	71	03-LAH-0548A			2cb-qtz-plg-cht rock	qtz-plg-2cb		ru-op	mgcht aft plg, ca-plg, rusty + not rusty cb
485704	5350485	61	03-LAH-0564A	msv		metagranodiorite	plg-qtz-kf	cht-epg-wm	act-bt′	epg-cht-act aft?, cht aft bt, wm-epg aft plg
486432	5351014	61	03-LAH-0571A	m gsr, anldl		metagranite	plg(-ve)-qtz-kf		wm-op	good eg of texture in defmd gntd, qtz veins
486646	5351515	61	03-LAH-0573A	w defm, gsr		altered metagranitoid	fp(altd)-qtz		epg	epg is meta, altd fp plg? , qtz broke polygd
478966	5356820	12	03-LAH-0608A2	msv		metabasite	2 am-plg	qtz	tit-op-cht	hn + act, plg-rich rock
484979	5361707	21	03-LAH-0623C		w wm	felsic metaclastite	plg-qtz-wm	cb (rusty rims)	op	plg is -ve to qtz, cb-wm but no epg or bt
492172	5365014	21	03-LAH-0627A	msv		qtz-plg metaporphyry	plg-qtz	wm	cht-op-epg	partly resorbed qtz phenos, plg phenos
491823	5365079	21	03-LAH-0629A	wpo		qtz-plg metaporphyry	plg-qtz	wm-cht	op-epg	
491443	5365634	21	03-LAH-0634A	mpo, fldd qz vn		qtz-plg metaporphyry	plg-qtz	wm-cht	cb-op-m/z	qtz-cb vn fldd about mpo
491235	5365133	21	03-LAH-0637A	mpo		felsic metaclastite	plg-qtz-wm	cht-cb	op	rounded qtz grains/phenos, more matrix
475774	5356631	11	03-LAH-0666A	wpo		metabasite	cht-am	op-epg	cb-cpx′?	rather mafic rk, umaf?
489953	5353502	22	03-LAH-0668A	mpo aggreg		intm metaclastite	plg-qtz-cht	bt-cb-epg	tit-op	plg is -ve to qtz
492516	5353206	61	03-LAH-0676A	msv		metatonalite	plg-qtz	wm-epg-cht	act-bt′-hn-tit	cht-epg-tit aft bt, act aft hn, wm-epg aft plg
492705	5353590	61	03-LAH-0678A	msv		metatonalite	plg-qtz-	kf-wm-epg-cht	ac-bt′	act aft hn, wm-epg aft plg, cht-epg-tit aft bt
492554	5350727	62	03-LAH-0688B	plg po primary?		metagranitoid (alkalic)	plg	hn-bt	epg-tit-qtz	bt replacing hn?, hn alkalic, hn locally hetero
489141	5348578	32	03-LAH-0697A2	mpo cht, tlc		metaultramafite	wm(tlc)-cht	op	am(clss)	am oblique to mpo, am just getting going
488873	5348416	12	03-LAH-0699A			metabasite	hn(actinolitic)-epg		qtz-plg-op	TS too thick for good ID
487476	5351935	22	03-LAH-0700A1	mpo		intm/felsic metaclastite	plg-qtz	bt-am	op	cm scale clasts, TS too thin
485534	5360535	21	03-LAH-0723A	mpo fldd qtz vn		mafic metaclastite	plg-qtz-cht-cb-wm		op	spectac cb poiks PO, qtz vn fldd about mpo
490039	5362765	21	03-LAH-0804A	wpo cht,agg		metaclastite	qtz-plg-cht	cb	ru-wm-epg	
487546	5357730	21	03-LAH-0813A	wpo agg, vn		metafelsite	plg-cht	qtz	ru-op-wm-m/z	cb-wm vn
487699	5351167	22	87615/1529.2	mpo wm,agg		felsic metaclastite	plg-qtz-wm	bt-epg	tit	clasts define mpo also
487699	5351167	22	87615/1531.6	msv		felsic metaporphyry	plg-qtz	cht	tit-bt-ap	some of cht aft bt?
487699	5351167	22	87615/1541.35	wpo agg		intm metaclastite	plg-qtz-bt	am(blgrn)	epg	
491328	5356752	22	03-MGH-0007A	wpo		intm metavolcanic rk	plg-qtz-epg-bt-cht	cpx(vein)-am-kf		polymeta rk?, messy for 73 (cpx), bt-cpx aft?
491522	5356597	22	03-MGH-0009B	mpo aggreg		mafic metaclastite	plg-qtz-op	bt-un/epg-cht	wm-op	high op, messy text, vfgr, metaltd mafic rk?
489264	5355545	11	03-MGH-0029A2	mpo am		metabasite	am(clss)-plg	epg-cht		cless am very pale for metabasite, amygs
489970	5356077	22	03-MGH-0032A1			intm/maf mvolc brx	plg-epg-un(epg?)-qtz	act-op-wm-cb	bt	could be 11 with bt
491524	5347129	11	03-MGH-0040A	msv		metabasite	epg-act-cht-plg		op	well rexl, am vein, TS too thin
493296	5349177	11	03-MGH-0046A	msv		metabasite	act-epg-cht	plg-wm(aft plg)	op-tit-qtz	classic, tit is fuzzy type
490606	5355432	11	03-MGH-0048A1	msv		metabasite	act-epg	plg-qtz	cht-op	polygd qtz-epg amygs, very little cht
491782	5350290	62	03-MGH-0056A	msv polygd qtz		metatonalite	plg-hn	epg-wm(aft plg)	tit	hn aggreg clearly meta aft?, gsr, broken fp
494562	5358125	11	03-MGH-0059A	msv		intm mvolc/mclastite	plg-epg-op-qtz	cht	bt(r?)-act?	11/21 if bt relict, 22 if metamorphic
494562	5358125	22	03-MGH-0059B	mpo		metaclastite	plg-qtz-wm-cht		bt-op	bt just nucleating or relict, messy looking rk
493114	5358397	71	03-MGH-0062A1	mpo	m cbwm	cbwmaltd metaclastite	wm-cb-qtz-epg-	"plg"		pre- to syn-meta ait
493733	5357503	71	03-MGH-0066A	msv		intm metavolcanic rk	plg-cht-epg-cb-qtz		tit?	11 with no act?, use epg to make it 72?

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
489067	5364220	21	03-MGH-0077A	msv		fel/intm metavolc rk	plg-qtz-cht		ap-op-ru	cht in matrix, pseudos, and seams
488892	5364338	21	03-MGH-0082A	msv		intm metavolcanic rk	plg-qtz-cht-cb		op-ru-ap	ru prominent, cht in matrix, pseudos, seams
489204	5364267	21	03-MGH-0083A	msv		intm metavolcanic rk	plg-qtz-cb-cht	wm	ru	cb porphyroblasts PO, cb-cht-ru = 71 also
488540	5353695	11	03-MGH-0125A	wpo fldd qtz vn		mafic metavolc brx	act-epg	cht	tit-op	folded faulted polgonized qtz vein
491213	5351663	22	03-MGH-0131B	mpo cht, am		intm metavolcanic rk	plg-qtz-cht-epg	bt-act	tit-op	11 with bt, defmd polygd qtz extension veins
489784	5351620	11	03-MGH-0132A	mpo		intm metaclastite	plg-epg-qtz	act-wm-cht		could be 21
489784	5351620	22	03-MGH-0132B	mpo aggreg		intm metaporphyry	plg-epg-wm-qtz	hn′(brn)-bt-cht	bt′	brown hornblende
491467	5348749	11	03-MGH-0135A	mpo		metabasite	act-epg	cht	tit-op-wm	
490564	5348612	32	03-MGH-0137A1	msv		metaultramafite	cht-am-se	op		clss am is tremolite?, am-se/cht vein
490564	5348612	32	03-MGH-0137A2	msv		metaultramafite	am-cht-se	op		relict spinifex text
492234	5350081	61	03-MGH-0138A	gsr, mortar txt		metatonalite	plg-qtz	wm-epg-cht	tit-op-cb	plg partly to ab-wm-epg, cht likely after ig bt
492242	5349853	22	03-MGH-0139B	mpo		metafelsite	qtz-plg(-ve)	wm	cht-grt	note grt!, some cht after bt
492423	5349848	61	03-MGH-0141B	mpo gsr		metatonalite	plg-qtz	wm-cht	epg-tit-zi	wm in plg + cgr aggreg aft?
491670	5349795	61	03-MGH-0142A	gsr, polyd qtz		metatonalite	plg-qtz-cht	hn-wm-epg	tit-ap-act	plg to wm-epg, bt to cht-tit, ign am rexl, to act
491587	5349725	22	03-MGH-0143B	msv		fp metaporphyry	plg-qtz	am(clss)-wm-epg	tit-op	plg to wm, PO 22 due to am
493826	5349967	21	03-MGH-0149A	gsr, sutd gb		qf metaclastite	plg-qtz	wm-cht-epg	cb-op-m/z	wm aft plg, qtz polygd, sutured gb
493893	5350630	61	03-MGH-0152B	wpo aggreg		metatonalite	plg-qtz	hnr-cht-epg-wm	act-tit	cht aft bt, act aft hn, lengthfast wm (Marg?)
494099	5350557	11	03-MGH-0154A	wpo		intm metavolcanic rk	plg-epg-am(grn)	cth-cb	bt	22 with bt, possibly 72, am is green
494028	5350298	21	03-MGH-0155A	mpo fldd qtz vn		felsic metaclastite	qtz-plg-epg-wm-cht		op	wm-cht aggreg=po, fldd polygd qtz vn
494423	5351240	11	03-MGH-0162A	msv		intm metavolcanic rk	plg-qtz-epg-cht	act	op	probab meta felsic/intm, not malted felsic rk
491800	5350077	72	03-MGH-0170A	mpo am		mafic schist	act(grn)-cb-cht	op	tit-qtz	am is pale grn to grn, PO possibly 11?
488033	5351197	12	03-MGH-0181B	am vn		mafic metabreccia	epg-plg-hn-bt-cht	act(matrix?)-wm	op.	messy, epg-bt in clasts, maltd felsite?
488101	5351569	22	03-MGH-0193A1	ipo, cht, aggreg		intm metaclastite	plg-cht-epg-qtz	wm-bt	op-tit	epg-cht pseudos aft bt′, too much cht for fels
488101	5351569	21	03-MGH-0193A2	mpo aggreg	m cb	meta-cbaltd felsite	plg-qtz-wpg-cht-em		op	epg in seams, a lot of epg for fels, mcbaltd fel
488101	5351569	22	03-MGH-0193B			plg metaporphyry	plg(-ve)-qtz	bt-epg-cht	tit on op	vfgr bt aft ign bt?, cht-epg-cb pseudo.
488877	5351313	11	03-MGH-0201B1	mpo am cht		intm metavolcanic rk	plg-epg-cht-act	wm	op	really 11 but cht-wm allows 21
489351	5351494	22	03-MGH-0205A	mpo aggreg		intm metaclastite	plg-qtz-epg-cht	tit	bt-act-op	act best in seams, bt in qf zone
489829	5352072	12	03-MGH-0213B2	am-qtz vn		intm plg metaporphyry	plg-am-epg	cht-qtz-op		am(grn) variably coloured in vein, lots epg
489225	5353145	11	03-MGH-0220A	wpo qtz vn		metabasite (plg-rich)	plg-act-epg-cht	qtz(vein, amyg?)	op	ellipsoidal plg phenos, magmatic rounding?
489153	5351133	22	03-MGH-0226A	defmd qtz vein	prem cb	felsic metaclastite	plg-qtz-bt	wm	op-tit-cht	prem cbalt, bt in and close to qtz vein
488801	5350662	42	03-MGH-0229A	ipo bt,cht, agr		mafic schist	bt-cht-plg-qtz	epg	tit-op	transposed polygd qtz-fp(-ve) vein,
489332	5349816	12	03-MGH-0265A	mpo am		metabasite	2am	epg-qtz	cht-tit-op	qtz polygd, am blgrn to olgrn, some clss am
499639	5354310	31	04-MGH-0006B	msv cht vns		metaultramafite	wm-cht(mg)	ru	m/z-ap	if wm=ms, mwmalt(41) m/z not typic of umaf
497576	5353975	11	04-MGH-0018A	mpo cht aggs		intm metaclastite	plg-cht-epg	qtz	op	rxl qtz vn
497279	5354435	22	04-MGH-0022A	mpo bt,cht,epg		intm metaclastite	plg-cht	epg-bt	op-cb	
496935	5353855	22	04-MGH-0031A	mpo agg		metaclastite	plg-cht-wm	qtz	bt (some to cht)	if bt is relict, 21 is correct

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
499126	5353998	41	04-MGH-0037A	w-mpo wm agg		felsic metaclastite	wm-qtz-cht-plg	op	cb	lots wm
497509	5347166	12	04-MGH-0042A	mpo agg		metabasite	2am-epg	plg-qtz	op-tit(fuzzy)	am (clss, blgrn-olgrn)randomly oriented
498566	5354202	21	04-MGH-0051B	m-wpo agg		intm metclastite/porph	plg-cht-qtz	wm(vfgr	op-tit-cb	xl metatuff?
495497	5359917	11	04-MGH-0053A	msv		intm metaclastite	plg-act-epg-cht	qtz	cb-op	
496080	5360217	31	04-MGH-0058A	msv	prem cb?	metaultramafite	cb-tlc	op		so much cb wonder if there was premeta alt
497300	5348115	32	04-MGH-0063A	msv		metaultramafite	am(clss)-se-cht	op		
497937	5348406	32	04-MGH-0068A	msv		metaultramafite	am(clss)-cht	op		
503785	5361079	11	04-MGH-0074A	msv		metabasite	act-epg-plg	qtz	op-cht-tit(fuzzy)	
504056	5358408	11	04-MGH-0091A	mpo act, agg		metabasite	act-epg-plg	qtz	op-tit	probab upper 11, no cht?, amcolour variation
497428	5353675	11	04-MGH-0092A	msv		metabasite	act-epg-plg	qtz	tit-op	upper 11?, no cht?, metagabbro?
501923	5349283	32	04-MGH-0098A1	msv		metaultramafite	am(clss)-ol'	op-cht		photo op
501921	5349274	32	04-MGH-0098A2	msv		metaultramafite	2am(clss, pale beige)	cht-op-phlog		relict spinifex, NB possible phlogopite
501584	5349367	32	04-MGH-0102A1	msv		metaultramafite	olr-se-cht-am-op			photo op, relict ign texture?, am clss
501586	5349364	32	04-MGH-0102A2	msv		metaultramafite	am(pale grn)		cht(mg)-op	relict spinifex, fgr am grows across spin prism
501708	5348738	73	04-MGH-0108A	mpo agg		metamaf/umaf brx	am, cpx?-epg			ts too thick, unsure about cpx
496739	5347424	32	04-MGH-0117A1	msv		metaultramafite	am(clss)-cht	op		
496738	5347426	32	04-MGH-0117A2	msv am random		metaultramafite	am(clss)-op	cht(brn biref)		relict spinifex, NB spruce tree shaped op
496626	5347757	71	04-MGH-0122A	msv		metaclastte	cb(rusty)-qtz-cht(mg)	plg?-op (gra)	op	too much qtz for umaf, metased w/ umaf com?
496015	5360491	21	04-MGH-0124B	mpo agg,cht		intm/felsic metaclastite	plg-qtz-cht	cb-wm	op	
501143	5348327	13	04-MGH-0143A	mpo hn,agg		metabasite/amphibolite	hn-plg	op-tit		
502871	5366490	31	04-MGH-0149A	msv	m cb?	metaultramafite	cb-se	tlc		possibly meta-cbaltd umafic rk photo op
496435	5359578	71	04-MGH-0151A	wpo cb grains	icb?	metaultramafite/mble	cb		qtz-op	marble, likely mcbalt of umafic rk
496582	5359603	71	04-MGH-0152A	msv	icb?	siliceous marble	cb-qtz			
497829	5359749	31	04-MGH-0165A	msv	m cb	metaultramafite	se-cb	op		cb as fgr agg in ps aft ol, as vns
497900	5359991	11	04-MGH-0166A	msv		metabasite(fgr gabbro)	act-epg-plg	cht	op-tit-qtz	
499066	5365530	11	04-MGH-0174A	mpo act, agg		mafic metaclastite	act-plg-epg-qtz	cht	cb-op	
499160	5365422	11	04-MGH-0175A	mpo act, agg		metabasite	act-epg-plg	cht	op-cb	defmd-rxl cb-epg vn
498262	5363829	21	04-MGH-0178A	msv		mcbaltd felsic rk	qtz-cb-am	epg-cht	wm	
497387	5363592	22	04-MGH-0179A	mpo wm,agg		am fels metaporphyry	plg-qtz-wm	epg-cht-act	am'	act-epg in qf rock good enough for 22
499721	5366441	11	04-MGH-0182A	mpo cht,agg	m cb	mafic metaclastite	cht-plg-qtz-cb	epg	op	pre-meta cb alt or primary cb, no act
497602	5366349	21	04-MGH-0184A	msv polygd gb		metafelsite	plg-kf-qtz		ap-zi-cb-cht-wm	
498337	5367721	11	04-MGH-0186A	msv to wpo		metabasite	act-epg-plg-cht-qtz		cb-op	vfgr, suggestion of flattened amygs
504038	5366123	11	04-MGH-0188A	mpo act, agg		metabastite	plg-cht-act	epg	tit-op-cb	anastomosing cht seams
503149	5365967	71	04-MGH-0191A	msv cb vns	l cb	cbaltd metabasite	cb-plg	cht	op-tit	cb replacement of matrix, NB cb veins
500125	5364139	11	04-MGH-0194A	msv		metabasite	act-cht		qtz-op-plg	
499644	5348170	32	04-MGH-0202A1	msv relict igntxt		metaultramafite	cht-am(clss)-op			NB relict ign texture

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
499644	5348170	32	04-MGH-0202A2	msv		metaultramafite	am(clss)-cht(mg)	tlc?-op		relict spinifex
499027	5347812	32	04-MGH-0213A1	msv se vn		metaultramafite	am(clss)-cht(mg)	se(veins)-op-un	cpx	un is vfgr agg assoc with op
499033	5347821	32	04-MGH-0213A2	msv relict igntxt		metaultramafite	am(clss)	cht	op	am overgrows relict spinifex
499027	5347800	32	04-MGH-0213B	msv		metaultramafite	am(clss)-op	ol		
499883	5347699	32	04-MGH-0218A1	msv se vn		metaultrafafite	am(clss)	se(veins,ps)-on	cht	
499880	5347694	32	04-MGH-0218A2	msv		metalultramafite	am(clss)		op	
497703	5347572	32	04-MGH-0224A1	msv cht-op vn		metaultramafite	am(clss)-cht-se-op	un		un is semi-isotropic, beige; also in vn
497703	5347574	32	04-MGH-0224A2	msv		metaultramafite	am(clss w/ plg rims)	phlog	op	am in matrix pale grn, relict spinifex
496548	5360840	71	04-MGH-0267A1	msv	icb	metaultramafite	cb-tlc-plg		op	intense cbalt pre/syn metamorphism
496543	5360835	31	04-MGH-0267A2	mpo tlc, cb vns	cb?	metaultramafite	cb-tlc		op-plg	mpo tlc, cb vns perpendicular to mpo
496520	5360814	31	04-MGH-0267B	mpo tlc, defm z		metaultramafite	tlc-se-op	cb		defm zones, tlc veins, tlc mpo
496577	5360839	71	04-MGH-0267C	msv		cb-qtz rock (vein?)	cb-qtz- wm		op	is this a vein in umaf rocks?
496592	5360979	11	04-MGH-0268A	msv		metabasite	act-cht	epg	op	
496642	5361015	32	04-MGH-0268B1	msv		metaultramafite	am(clss)-cht(mg)	un		unknown is tiny high relief grains
496642	5361015	32	04-MGH-0268B2	msv		metaultramafite	am(clss)	cht(mg)-op		am grows across long D of spinifex "prisms"
487699	5351167	22	04-MGH-0283A	msv		metafelsite	fp-qtz	wm-cht	op-tit-epg-bt	NB epg stable with bt
487699	5351167	32	04-MGH-0283B1	msv		metaultramafite	cb-cht-tlc	am(clss)	op	am just getting going, blebby texture
487699	5351167	32	04-MGH-0283B2	msv		metaultramafite	cb-cht-tlc	am(clss)	op	am just nucleated
487699	5351167	32	04-MGH-0283B3							same mineral assemblage etc as 283B2
487699	5351167	32	04-MGH-0283D	mpo agg,am		metaultramafite	am-cht	op-cb(vein)		cb vein perpendicular to mpo
487699	5351167	32	04-MGH-0283E			metaultramafite				same mineral assemblage etc as other 283s
487699	5351167	32	04-MGH-0283F1			metaultramafite				
487699	5351167	32	04-MGH-0283F2			metaultramafite				
487699	5351167	12	04-MGH-0283G	msv		metabasite	am(blgrn-olgrn)-plg	epg	tit-bt	actinolitic hn or hn?, NB biotite
496644	5361017	32	04-MGH-0284B	msv		metaultramafite	am(clss)-cht-cb		op-tit	tit unusual in metaultramafite
496177	5350050	11	04-MGH-0289A	msv		metabasite	act-epg-plg		cb-op-tit	epg in matrix, and blebs/amygs?
497244	5350871	21	04-MGH-0290A	mpo wm,agg	wm?	felsic metaclastite	wm-qtz-plg		cht	wm-rich, maltd?
497368	5351717	22	04-MGH-0292B	wpo agg		sed/volc metaclastite	wm-cht-qtz-plg	bt-cb	m/z-op	lots of pleo halos
503660	5353703	13	04-MGH-0293A			metabasite				same as 293B
503660	5353703	13	04-MGH-0293B	mpo hn		metabasite	hn-qtz-plg	cht	op-bt	"sinistral" cht seams, cht aft hn
503212	5353775	11	04-MGH-0294A	msv cht-act vn		metabasite	act-plg-epg	cht-wm-qtz	op cubes	act is pale grn to olgrn, wm-cht-act vn
503661	5354548	13	04-MGH-0302A	mpo agg		metabasite	hn-plg	tit-qtz	op-epg	mpo looks better to naked eye then in ts
498854	5349377	32	04-MGH-0344A	msv		metaultramafite	am(clss)-cht(mg)		op	relict spinifex
495611	5355581	11	04-MGH-0502A	msv polygd vn		metabasite	act-plg	qtz-epg-cht	op	epg-qtz vein is polygonized
494958	5356182	11	04-MGH-0505B	msv		metabasite	act-cht	epg	op	
494672	5354377	61	04-MGH-0509	msv		metatonalite	plg-qtz-bt	hn-kf-epg-wm	op-m/z-ap-tit-ru	wm-epg-tit metamorphic assemblage

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
503281	5359200	32	04-MGH-0514B	msv		metaultramafite	act-cht(mg)-trem	op-cb		looks like act and tremolite here
503281	5359200	32	04-MGH-0514E	msv		metaultramafite/basite	act-bt(grnbrn)		tit-cht-cb	
503275	5359293	71	04-MGH-0515A	impo cht,agg	m cb	cht-cb schist	cht-cb		op-ru	likely mafic or ultramafic rk orig
503255	5359750	71	04-MGH-0517D	wpo agg,wm	cb?	"marble"	2cb	wm	plg-qtz-op	mcbaltd basalt?, one cb is rusty
500658	5361055	21	04-MGH-0522A	msv		qf metaporphyry	plg-qtz-kf?	cht	wm-cb	most wm aft plg, cb grains are rhombic
498799	5352395	11	04-MGH-0523G	msv		metabasite	act-cht-plg		op-tit	
495965	5356944	73	04-MGH-0539B	msv , vns		calcsilicate rk?	cpx?-wm(aft plg)-am			unsure about rock assoc here, mcbalt?
495692	5356468	11	04-MGH-0543A	msv		metabasite	act-cht-epg-plg		op	
496524	5354845	11	04-MGH-0555A	msv		intm metabasite	plg-act-epg	qtz	tit	
497144	5355907	12	04-MGH-0573A	msv		intm metabasite	plg-am(hnic act?)	qtz	op	uncertain about am compo, possibly 11
499824	5354371	21	04-MGH-0576A	mpo wm,agg	m wm	felsic metaclastite	plg-wm-qtz		cht-cb-op	wm-cb aft plg, pre/syn metamorphic alt
496912	5358001	71	04-MGH-0577A	mpo agg	m cb	metaclastite	plg-qtz-cb-wm	cht	epg	lots of cb, probably cbalt (pre/syn meta)
496694	5357569	21	04-MGH-0578A	mpo agg		qf metaclastite	plg-qtz	cht-cb	wm-ru-tit	
496775	5357261	41	04-MGH-0579A	m-ipo cht, agg		metasiltstone	plg-cht-qtz	cb-wm	op	fldd, polygd, lam qtz vn, cht grows over lamin
495815	5357582	21	04-MGH-0582B	wpo agg	m cb	felsic metaclastite	plg-qtz-wm-cb		cht-op-ru	cbalt pre or syn-metamorphic, rusty cb is euh
495603	5360024	21	04-MGH-0587B	wpo agg		felsic metaclastite	fp-qtz-wm	cb	op-cht	
496059	5360143	31	04-MGH-0590A	msv		metaultramafite	se-cht	cb-op		
496263	5360297	71	04-MGH-0591A	msv	cb?	siliceous marble	cb	qtz-plg	op	metamorphosed cb alt or primary cb?
494828	5357459	11	04-MGH-0592A	msv		metabasite	epg-act-cht(mg)	plg	op-qtz-cb	
494820	5357449	21	04-MGH-0592B	mpo cht,op,clts		intm metaclastite	plg-qtz-cht-epg	wm-cb	tit(vfgr)-op	cb as clasts or as a broken up vein
495168	5357621	11	04-MGH-0594A	wpo agg,cht		intm mclastite/volc	plg-epg-cht	cb-qtz	tit	cb blebs=clasts or amygs?
495368	5357495	21	04-MGH-0595A	mpo cht,agg		intm metaclastite	cht-plg	epg-cb-qtz	tit-wm	trace wm
497115	5359359	32	04-MGH-0605C	msv		metaultramafite	am(clss)-cht	op		
499635	5352368	21	04-MGH-0606A1	mpo wm,agg	iwm	felsic metaclastite	wm-plg	cht	cb-m/z-ru	NB rusty seams (not bt), iwmalt pre/syn meta
499635	5352368	71	04-MGH-0606B2	mpo cht, cren	cht cb	cht-cb schist/hsz	cht(grn)-cb	qtz	op	cht-cb alt and high strain zone
503674	5356760	11	04-MGH-0608A	mpo act,cht		metabasite	act(blgrn)-cht-epg	op-qtz-plg	tit	am defm zone, epg tails, polygd qtz vn
503753	5357171	12	04-MGH-0618A	msv qtz vn		metabasite	am(blgrn-olgrn)-epg-plg		tit-op-cb-wm	close to 11-12 boundary
503538	5362479	32	04-MGH-0621A	mpo am, agg		metaultramafite	2am-cht		op	clss + blgrn am, NB am mpo
503222	5362384	32	04-MGH-0624A	msv		metaultramafite	2am-cht	op		could blgrn am be ign?
497427	5357238	21	04-MGH-0628A	mpo cht,agg	m cb	intm metaclastite	plg-cht	qtz-cb	wm-op	wcbalt is pre/syn meta, cb in vn and matrix
497726	5357409	11	04-MGH-0631A	msv		metabasite	plg-epg-cht	qtz	cb-op	
497916	5357467	11	04-MGH-0633A		w cb	intm metaporphyry	plg-qtz-cht-epg	cb	ru-op	wcbalt is pre/syn meta
501744	5348146	12	04-MGH-0640B	msv	w wm	metabasite	hn-am(blgrn-clss)	cht-epg	wm(aft plg)	wmalt aft plg, 11 if hn is ign
501897	5348164	61	04-MGH-0641A	msv		metamonzodiorite	kf-cpx'-hn'	cht(aft bt)-epg	op-ap-tit-bt'-ru	hn rims on cpx that is assumed to be ign
500795	5358875	21	04-MGH-0642A	msv	cb wm	metafelsite	plg-wm-cb-qtz	cht	op	mcb-wmalt
500795	5358875	21	04-MGH-0642C	mpo wm,agg	iwm	felsic metaclastite	wm-plg-qtz-cht	cb	op	intense wm alt pre/syn meta

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
499654	5357376	21	04-MGH-0649C	mpo cht,agg		cht metatuff	cht-plg-qtz	cb	op	
499267	5357148	21	04-MGH-0657A	wpo agg,wm	cb?	intm metaclastite	wm-cht-plg-qtz	cb	op	polygd amygs, cb in blebs+ matrix, premeta?
498914	5357675	21	04-MGH-0663A	mav vn hsz		metafelsite	fp-qtz-cht(mg)		cb-tit	no wm or kf?, use cb-cht for 21
501193	5351628	21	04-MGH-0676A	mpo wm irreg		metafelsite	fp(plg/kf)-qtz	cht-wm		
497179	5349545	31	04-MGH-0678A	msv to wpo		metaultramafite	se-tlc	cb	op	low grade but nice texture photo op
496889	5349077	32	04-MGH-0679A	msv		metaultramafite	am(clss)-cht		op-tit	
497943	5359953	32	04-MGH-0683A	msv		metaultramafite	am(clss)-cht	op		
497919	5359986	11	04-MGH-0684A2	msv		metabasite	act-cht-plg	epg	op	
500868	5367681	11	04-MGH-0698A	mpo am, agg		metabasite	act-epg-cht	plg-qtz(amygs)	op	amygs
500869	5367682	11	04-MGH-0698B	msv		metabasite	act-epg-plg	cht	op-qtz-tit-wm	
503198	5365946	11	04-MGH-0701A	msv		metabasite	act-cht-plg	epg	op	pillow margin
499567	5347441	13	04-MGH-0707A	mpo hn lin		metabasite	hn-plg-wm	cpx(some zones)	op-qtz	wmalt of plg related to alt zones
500321	5347484	99	04-MGH-0720B			unknow, vein of un?				un is clss, low biref, optically +ve, small 2V
500762	5347177	61	04-MGH-0726A	msv		metamonzodiorite	plg′-kf′-cht	cpx′	hn/act′-tit-epg-op	ap also present, cht-tit aft bt′, am rims on cpx
498440	5348749	11	04-MGH-0729A	msv		metabasite	act-epg-plg	cht	op	
498611	5348829	32	04-MGH-0731A	msv		metaultramafite	am(clss)	cht	op	a bit of relict spinifex
497586	5350564	32	04-MGH-0740A	msv		metaultramafite	am(clss)-cht	op	tit clusters	relict spinifex
497586	5350564	32	04-MGH-0740B	msv		metaultramafite	am(clss)-cht(mg)	op	cb	
497750	5351028	21	04-MGH-0748A	wpo agg		fel mclastite/porphyr	plg-qtz	wm-cht	cb-tit(vfgr)	
497985	5351567	32	04-MGH-0751A	msv		metaultramafite	am(clss)-cht(mg)	op		spinifex
497985	5351567	32	04-MGH-0751B	msv		metaultramafite	am(clss)-cht(mg)	cb	tit?(vfgr)	
499368	5354271	32	04-MGH-0884A	msv		metaultramafite	am(clss)-cht(mg)	cb	op	cb in vn with cht margins
499368	5354271	31	04-MGH-0884C	msv		metaultramafite	tlc-cht-se?	cb	op	
499475	5354269	21	04-MGH-0885A	mpo wm,agg	iwm?	felsic metaclastite	wm	cht-plg-qtz	op-cb	possible wm is prod of pre/syn meta alt
503434	5355647	11	04-MGH-0889A	msv		meta?diabase	plgr-cpxr-amr	cht-wm	op	mwmalt of plg, cht aft bt, 10?
503434	5355647	11	04-MGH-0889B	msv, cht-act hsz		metabasite	act-cht(mg)	epg	qtz-op	OK proof diabase is 11, SG in vn?
499305	5354744	21	04-MGH-0892A	mpo agg	wm cb	metaclastite	wm-plg-cb-qtz-cht			71 also?, wm/cbalt alt or primary mineralogy
496928	5360887	11	04-MGH-0898A	mpo agg	cb?	intm/mafic metaclastite	cht-am(clss)-cb	qtz-plg	op	cb = alt or primary?
497156	5360983	32	04-MGH-0899A	msv		metaultramafite	am(clss)-cht(mg)		op	spinifex
497080	5361125	71	04-MGH-0901A	msv	cb?	metaclastite/altd basite	cht-plg-cb	qtz	ru-op	assuming 21/71 cb-qtz-cht
490711	5372691	21	03RJB0007-1	mpo qtz vn	w cb	felsic metaclastite	qtz-fp(-ve) cb-cht-wm		op	msed, mvlcl, cht seams = mpo, cb pre/synmet
489644	5372120	42	03RJB0009-1	mpo		metasiltstone	plg-qtz-bt-cht		epg-op-gra	mpo (cht, bt, agg) parallel lyr
484247	5371270	41	03RJB0011-1	mpo wk cren		metasiltstone/mudst	wm-plg-qtz	cht	op-un-to	vfgr, syndepositional fault?, un = tit?
491663	5374514	21	03RJB0019-1	msv		metafelsite	plg-wm	cht(mg)-cb	op	plumose plg to wm in part, cb discrete grains
491646	5374429	42	03RJB0021-1	wpo wm, agg		metamudstone	wm-qtz-cht	cb	gra-ru-to	po deflected around cb porphs, gra rims on cb
491689	5374374	99	03RJB0024-3	msv polygd		meta-quartz vein	qtz	cb		metamorphosed but grade unknown

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
491716	5374379	21	03RJB0025-1	dfmd rxl qtz vn	m cb	meta cbaltd felsite	fp(-ve)-qtz-cb	wm-op		cb alt premeta, qtz and qtz-plg veins
491716	5374379	21	03RKB0025-2	dfmd rxl qtz vn	m cb	meta cbaltd felsite	fp(-ve)-qtz-cb	wm-op		cb alt premeta, qtz and qtz-plg veins
491689	5374407	41	03RJB0027-1	lyr ll wpo		metamudstone	wm-qtz-plg	cht-cb	op-gra	vfgr; cb as porphs, vn; po = wm, agg
491970	5374677	31	03RJB0033-1	wpo cht seams	m cb	meta-cbaltd umafite	cb-wm(tlc)	cht	op	cb alt pre to synmeta ; wm likely tlc
492050	5374645	21	03RJB0039-1	w-mpo cht, agg		metaclastite, maf mtuf	plg-qtz-cht(mg)-cb		ru-to-op	grade from cht-cb, no wm, cb porphs
492791	5374852	71	03RJB0051-1	m-ipo cht, agg		cht-cb schist/metabrx	cht-qtz-plg-cb	un (reddish agg)	ru	op overgrows fln, un = subgz phase?
492780	5374882	11	03RJB0052-1	mpo cht, agg		metabasite?	cht(mg)-plg	cb(rusty)	op-qtz-ru	possible tit, no wm
492756	5374796	21	03RJB0055-1	mpo wm, agg	m cb?	metawacke	plg-qtz-wm-cb		cht-op-ru-zi	cb clasts interstit, primary or premeta alt?
487226	5378640	71	03RJB0097-1	wpo wm, agg		metaclastite	cb-wm-qtz-plg		cht-op-ru-zi	cht is mg, ragrade could be 21
487134	5378707	41	03RJB0098-1	msv		metaclastite	cht(mg)-qtz-plg	wm-cb	op	cb as discrete grains/porph, 41 as lots of cht
486594	5377675	71	03RJB0103-1	mpo cht, agg		metaclastite	2cb-qtz-plg	cht(mg)-wm	op-ru	cb primary or prod of alt? rusty/not rusty cb
486266	5377461	21	03RJB0104-1	w-mpo cht, wm		metawacke	qtz-plg-cht(mg)-cb	wm	op	individ wm cht and aggregates define po
486138	5377181	11	03RJB0106-1	wpo agg		mafic metaclastite	plg-act-cht-epg-qtz	op-tit-cb		
486105	5373031	71	03RJB0117-1	polygd qtz vn		meta cbaltd mafic rock	cth-qtz-plg-cb		op-ru	
490875	5380848	41	03RJB0136-1	cren mpo wm		metamudstone/sltst	wm-qtz-plg	cb(rusty)-cht	ru-to	dfmd qtz vein, cb porphs overgrow wm
489963	5378026	51	03RJB10889-1	mpo wm		gra-rich chem msed?	2op-qtz(vfgr)	wm	cb-un	un is isotropic, polygd qtz vn, qtz fibres
489963	5378026	32	03RJB10889-5	wpo agg		metaultramafite	wm(tlc)-cht-cb	am(plgrn)	op-tit	wm likely tlc, is cb meta or pre-meta alt/
489943	5377967	11	03RJB10893-1	mpo	m cb?	intm metaclastite	plg-qtz-cht-cb		op	relict skeletal ign op, plg in matrix, "clasts"
489913	5377989	21	03RJB10894-3		m cb?	felsic metaclastite	plg-cht	cb (vein, matrix)	ru-op	meta-cbaltd porph? No cht
489913	5377989	71	03RJB10894-9	polygd cb vn	i cb	meta mineralization/alt	cb-wm-op		ru	no cht wm rims pressure shadows on su
489913	5377989	41	03RJB10894-10	ipo wm, agg		gra-itic metamudstone	wm-qtz-gra-op	cht(mg)	to	crenulation of ipo which is parallel lyr
492117	5372969	41	03RJB18965-1	ipo, lyr, cren		metamudstone/sltst	qtx-wm-gra	op-cb	ru-cht-un	minor cht, lyr ll ipo, crenulated, un = red isotrop
492277	5374518	22	03RJB18966-1	mpo wm, clasts	w cb?	metawacke	qtz-wm-plg-cht-cb	bt	m/z	cb primary or prod of alt?
492277	5374518	22	03RJB18966-5	mpo wm, agg		metawacke	qtz-plg-wm	cnt2 aft bt	bt cht	bt to cht2(fe), cht(mg), 21 on top of 22
492277	5374518	32	03RJB18966-10	msv, dfmd q vn		metaultramafite	am(cls)-cht bt-cht-cb	qtz tit		boudined qtz vein, bt-cht-cb with vein, mcgl?
492277	5374518	32	03RJB18966-15	mpo cht, am		metaultramafite	am(clss)	cht(fe)	op-ap	
492277	5374518	32	03RJB18966-17	wpo am, agg		metaultramafite	am(clss)	cht(fe)	op	
492277	5374518	22	03RJB18966-119	mpo wm, agg		lithic metawacke	qtz-plg-wm-cht	bt-2cht	op-cb-m/z	po inside clasts ll po in matrix, cht2 aft bt?
492553	5373996	11	03RJB18967-1	lyrd		intm metavolcclastite	plg-qtz-cht-am(plgrn)		tit-op-stp	green stilpnomelane
492553	5373996	11	03RJB18967-3	msv, bt kinked		metalamprophyre	bt-cb	am-cht	op-tit	am-cht aft bt, cht also in matrix
493576	5373801	41	03RJB18968-1	mpo wm, agg		metasiltstone	qtz-wm-plg	cht	ru-to-cb	
493576	5373801	11	03RJB18968-4	ipo am, cht, agg		metabasite	act-cht-plg	bt-cb-qtz-epg	op	bt-bearing metabasite so equiv to 22
494349	5373185	32	03RJB18969-1	wpo am, agg		metalultramafite	am(clss)-wm(tlc)	cht	op-ru	am likely tremolite, wm likely tlc
494349	5373185	52	03RJB18969-3c	ipo ll lyr, am bt		metamarl	qtz-fp-bt-cb-act	stp	op	photo op, stp random to ipo/lyr, 72 also
494349	5373185	62	03RJB18969-4	gsr, wpo cht		metatonalite/albitite	plg(-ve)-2bt-cht(mg)		op-m/z-ap	agg of fresh bt aft ign bt, both ok with cht
494349	5373185	32	03RJB18969-7	hsz, mpo in vns		metaultramafite	wm(tlc)-cht-cb	am(clss)	op	am just nucleated, NB po in extension veins

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
491555	5372932	21	03RJB18972-1	ipo cren		metawacke	qtz-plg-wm	cht-cb	qp-to(brn)	cren in mica-rich lens, not much cht, cb porphs?
491555	5372932	32	03RJB18972-5	wpo am, cren		metaultramafite	ct(mg)-am(clss)		op-cb	am likely tremolite
492155	5375484	41	03RJB18973-1	ipo qtz-wm		graphitic schist	op(gra>su)-qtz	wm	cb-cht-to	ipo in qtz-rich zone, spectac fibres, P shadows
492155	5375484	21	03RJB18973-2	wpo		fgr metawacke	qtz-plg-wm	cht-epg	op	fuzzy plg partly replaced by wm, lower grade
492155	5375484	21	03RJB18973-5	wpo clasts agg		lithic metawacke	qtz-plg	wm-cht-cb	op-to	felsic clasts, lower grade, less deformed
492155	5375484	71	03RJB18973-12	msv		metacbalt/metased?	cb	cht-qtz	op-ru	meta-cbaltd rk, metased, ra uncertain
492155	5375484	72	03RJB18973-16	mpo am with qz		meta-cbalt-qtz vein	epg-cb-qtz	wm-am(clss)	op	am in qtz-rich zone, polygd qtz vein
492155	5375484	21	03RJB18973-21	msv		intm mvolc/malbitite	plg	chtt-epg	wm-op	prismatic plg not to extinct, rxl or replaced by?
491395	5375073	31	03RJB18974-1	msv	i cb	meta-cbaltd umafite	cb	cht-plg	qtz-ru-op	ru in cht agg, cb alt pre or syn metamorphic?
491395	5375073	31	03RJB18974-3	msv	i cb	metaultramafite	cb-cht(mg)-plg		op	cbalt pre or syn-metamorphic?
491395	5375073	31	03RJB18974-4	msv		metaultramafite	cht	plg	op-un-to	
491395	5375073	31	03RJB18974-6	mpo cht, hsz	i cb?	metaultramafite?	cb-cht-plg		op-ru-qtz	cb is not late, it is recrystallized
491395	5375073	71	03RJB18974-8	polugd qtz vn	i cb?	meta-cbalt umaf?	cb-cht(mg)	qtz (mostly vn)	ru-op	could be 31
491395	5375073	31	03RJB18974-10c	mpo tlc zone	i cb?	metaultramafite	cb-tlc	qtz (mostly vn)	op	bent broken cb
491395	5375073	31	03RJB18974-11	msv	i cb?	metaultramafite	plg-cb-cht		op	possibly meta-cbaltd basite
491395	5375073	31	03RJB18974-13	msv	i cb?	metaultramafite	plg-cb	cht	op	possibly meta-cbaltd basite
491395	5375073	31	03RJB18974-15	msv cht vn	i cb?	metaultramafite	cb-plg-qtz-cht		op	possibly meta-cbaltd basite
489916	5378172	71	03RJB5045-1	hsz in zht zone		metaultramafite?	cb-cht(mg)	plg(untwinned)?	op-qtz	metaclastite? Could be 31
489916	5378172	31	03RJB5045-2	mpo cht,agg		umaf metaclastite	ct-cht-plg?	qtz	op	
489916	5378172	11	03RJB5045-3	msv		metabasite	act	cht-epg	op	
490838	5378035	31	03RJB5282-1	mpo wm, agg		metaultramafite	tlc-cht	plg	op-qtz	cb-qtz vein is polygd
490838	5378035	31	03RJB5282-2	msv		metalultramafite	tlc-cht-cb		op-qtz	euhedral cb in tlc-cht matrix
490838	5378035	31	03RJB5282-3	mpo agg		metalultramafite	tlc	cht-plg	op-qtz-cb	
490829	5377781	32	03RJB5284-1	msvie		metaultramafite	am(blgrn)-cht	qtz seams	tit-ur-op	
490829	5377781	32	03RJB5284-2	mpo cht, agg		metaultramafite	am(clss)-cht(mg)		op	am also defines mpo
490577	5377866	42	03RJB5410-1	mpo agg, cht		wm-cht-bt schist	cht-wm-qtz	am(clss)-bt	op	
490330	5377990	31	03RJB5422-1	msiv		metaultramafite	wm(tlc)-cht	cb	qtz	tlc-rich zone
491444	5377622	31	03RJB5698-1	wpo agg		metaultramafite	tlc	cht-cb	op-qtz	
491444	5377622	31	03RJB5698-2	mpo tlc, agg		metaultramafite	wm(tlc)-cht-cb		op	euhedral cb in cht-tlc matrix
492920	5377768	71	03RJB6025-2	mpo wm, agg		metamarl	cb-qtz	plg-wm-cht	ru	cb vein cuts po at right angles
492920	5377768	71	03RJB6025-6	mpo agg		metamarl/mcbaltd bas	cb-wm-cht-plg	qtz	ru-op	vfgr
489027	5376844	41	03RJB6405-1	mpo ll lyr, veins		metasiltstone/mudst	qtz-op-(gra)-wm	cht		syn-mpo veins, cb core qtz rims
489027	5376844	41	03RJB6405-2	mpo ll lyr, wm		metasiltstone/mudst	wm-qtz	plg?-op (gra)	cht-to	most of opaque is graphite
489027	5376844	21	03RJB6405-3	wpo agg		lithic metawacke	plg-qtz	cht-wm	op-cb	fuzzy low grade look
489027	5376844	21	03RJB6405-5		m wm	lithic metawacke	plg-qtz-wm	cht-cb(veins)	op	wmalt of plg pre- or syn meta?, matrix wm too
489025	5376694	41	03RJB6406-1	mpo wm /lyr		metamudstone	wm-qtz-fp?	cht	op(gra)-to	classic bedding /cleavage D1

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
489025	5376694	41	03RJB6406-2	mpo cuts lyr		metamudstone	wm-qtz-plg?	cht	op-to	photo op, S_M/S_0, S_M = regional S_1?, axpl clv
490726	5376891	41	03RJB6510-2	mpo cuts lyr		metamudstone	wm-qtz-plg?	cht-op	op	vfgr, classic S1/So.
490726	5376891	41	03RJB6510-4	mpo cuts lyr		metamudstone	wm-qtz-plg	cht	op-cb	classic bedding /cleavage D1
490725	5376741	41	03RJB6511-1	mpo cuts lyr		metamudstone (gra)	wm-qtz-plg	op-cht?	cb	vfgr, classic S1/So.
490725	5376741	41	03RJB6510-3	mpo cuts lyr		metamudstone (gra)	wm-qtz-plg(-ve)	op	cb-to	classic bedding /cleavage D1
586498	5331159	11	003VOI-0016-1	msv		metabasite	plg-2am(hn′-act)	cht-epg	t-op	is hn relict? If yes, is good 11
589382	5330332	61	003VOI-0066-2	msv gsr(mod)		metasyenite	afp	cht-qtz-op-cb	bt′-ru	
588635	5331143	11	003VOI-0083-1	m-ipo cht, aggs		metabasite/cht schist	cht-epg-plg	op-cb-qtz		
589991	5330669	41	003VOI-0098-1	ipo ll lyr, cren		metasiltstone/mudst	wm-qtz-cht	cb-plg	op-ap	photo op
589837	5329817	31	003VOI-0109-2	mpo wm cb		metaultramafite	cb-wm(tlc)	qtz vn defmd	op	NB defmd qtz vein, assume wm=tlc
589682	5329910	21	003VOI-0115-2		cb pm?	fp metaporphyry	afp	cb	op-ap-cht-wm	only trace wm-cht, pre-meta cb alt? 71 also?
585574	5332728	62	003VOI-0122-3	msv		fgr metagranite	kf-ab-qtz		act-epg-cht-zi	act-epg=meta, NB no wm, "~10m fromcontact"
585558	5332812	11	003VOI-0128-1	msv		mafic metaporphyry	plg-2am(hn′?-act)	cht-epg	op	alkalic?, mafic incl?, rk is 12 if hn is metamorph
585489	5332955	22	003VOI-0138-1	msv		qf metawacke	fp-qtz		cht-bt-cb-op	
585972	5332966	11	003VOI-0163-2	msv		metabasite/porphyry	plg-act-hn′	epg	cht-op	
585982	5332541	21	003VOI-0168-1	gsr fractured		fel metaclastite/porph	fp	cht-cb	op-wm-m/z-ap	
586036	5332702	71	003VOI-0172-1	mpo clasts, agg	cb cht	felsic metabreccia	plg-cb	cht	op	
586110	5332741	21	003VOI-0173-1A	mpo cht, agg		intm metabrx/vlcl	plg-cb-cht	qtz-wm	op	also brittle defm, enough cb for 71?
586110	5332741	71	003VOI-0173-1B	mpo agg		intm metabrx/vlcl	plg-cht-cb		op-wm-qtz	faulted? Much fractured
587480	5333193	21	003VOI-0269-1	polygd gb, mdef		felsic metaclastite	plg-qtz-kf	cht-cb-wm	op	tectonoclastic?
587487	5333238	21	003VOI-0270-1	wpo aggs	mcb	felsic metaclastite	plg-qtz-cb-wm	cht	op	lithic clasts, mod cbalt(pre- or syn-meta?)
587310	5333290	11	003VOI-0278-1	wpo aggs		metabasite(porphyritic)	epg(brnish)-act	cht	bt-op-tit-cb	act with/without bt pseudos aft hn? NB bt
587236	5333449	11	003VOI-0289-1	brittle-ductile		intm metaclastite	plg	act-epg-cht	ap-ap-qtz-wm	wm in plg, close to fault zone?
587531	5333123	21	003VOI-0305-1	gsr mdefm		felsic metaclastite	kf-plg		cb-op-cht-wm-qtz	very little cht
587495	5332978	21	003VOI-0310-1	mpo wm, aggs		felsic metaclastite	wm-plg-qtz	cb	op-cht	qtz fibres in Pshadows on op
588444	5331798	21	003VOI-0349-1	S_M, wk S_L		felsic metaclastite	plg-cht	op-cb-qtz	wm aft plg	polygd qtz vn, likely metased rounded clasts
588556	5332254	41	003VOI-0356-1	mpo cht, wm		psammitic schist	wm-cht-plg-qtz	cb(rusty)	op	
588562	5332289	41	003VOI-0356-2	mpo cren		psammitic schist	qtz-plg-cb-wm	cht	op	
588589	5332317	41	003VOI-0357-1	ipo aggs, wm		micac metawacke	plg-qtz-cht-wm-cb		op	gradational to 71
588108	5332237	21	003VOI-0374-1	ipo cht agg		cht-op metaclastite	cht-qtz-plg	op-cb-wm(plg)		gradational to 41
588254	5332643	22	003VOI-0385-1	mpo agg		fgr metaclastite	plg-qtz-epg(brn)	bt-cb	op-cht-tit	
587865	5332774	22	003VOI-0412-1	mpo agg pebs?		bt-epg metaclastite	epg(brn)-bt-act	cht-cb-qtz	op	some cht aft bt, lots epg(ex cb-rich?)
587842	5332221	22	003VOI-0422-1	mpo agg	cb?	felsic metaclastite	plg	cht-op-cb	bt-tit-wm(aft plg)	possibly 21 on top of 22, unsure if cb is alt
587657	5332418	11	003VOI-0429-1	mpo agg, xl		mafic cpx metaporphy	act-epg-cpx′(phenos)	bt	cb-op	lots bt, metalamp?, clss am rims on cpx
587629	5332262	42	003VOI-0440-1	mpo agg		bt-cb schist	bt-cb-plg		cht-op	bt not all ll mpo (contact meta?), ts label wrong
589016	5332583	22	003VOI-0482-1	wpo aggs		intm metaclastite	plg-bt-epg	op-cht	ap-cb	bt aggregates after?

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
589285	5332722	21	003VOI-0484-2	mpo, open cren		felsic metaclastite	wm-plg-qtz-cb(rusty)		op-ap	dissem euhedral cb, wm-Fecb-qtz=21/41
586274	5332274	21	003VOI-0526-1	qtz fibs		felsic metaclastite	plg-wm-cb-qtz		op	spectac qtz fibres on op, wm=likely metased
586274	5332274	41	003VOI-0526-2	mpo qtz fibs		wm phyllite	wm-plg-qtz	op-cht	cb(euhedral)-zi	wmalt pre or syn-meta?, qtz fibs on op
589300	5331297	41	003VOI-0536-2	mpo agg, wm	wm	metasiltstone	plg-qtz-wm		cht-cb-op-ap-to-zi	qtz fibres in Pshadows on op, hsz
589358	5331803	21	003VOI-0543-1	mpo wm,aggs		metawacke	plg-qtz-wm	cht	op-cb-zi	
589218	5331819	21	003VOI-0570-1	wpo wm,agg	wm	metawacke	plg-wm-qtz	cjt	op-cb	wm = netaweathered protolith, metaalteration?
588464	5331501	21	003VOI-0577-1	wpo ll lyr cren	wm	metasiltstone/mudst	wm-qtz	cht	op-gra?	qtz fibres on op
586420	5332380	21	003VOI-0611-2	qtz fibs	to?	felsicto metaclastite	plg-qtz-to-op	cb(rusty)	cht-wm	cm scale frags, NB to-rich, to random
586214	5332327	21	003VOI-0612-1	hsz	cb	felsic metaclastite	plg-cb-wm	cht-qtz	op-m/z	is cb pre or syn meta alt? gradational to 71
588929	5330575	41	003VOI-0657-1	ipo hsz		phyllite	wm-qtz-plg?	cht	op-ru	
588452	5331191	71	003VOI-0664-1	ipo cht agg	cb	phyllite	cht-cb-qtz-plg	op		cht very grn, like yK cht-cb zn
586964	5331210	12	003VOI-0679-1	msv		metabasite	act-hn	epg	plg-op-tit-qtz-kf?	varioles?, epg in clots and aft plg
586964	5331210	11	003VOI-0679-3	msv	cb	metabasite(intm)	plg-cht-cb	op	qtz-wm(in plg)	no act or epg, high CO2? Cbalt, possibly 71
587848	5330773	11	MB96-8A-132.0	msv		metabasite	hnr-plg-epg(aft plg)	cht	bt(grn)-act-op-cb	prefer 11 on ign but 13+11 is possible
587822	5330782	11	MB96-8B-126.5	msv		metabasite	hn^{r}	plg-epg-act-cpx^{r}	op-tit	cpx inside/outside hn, act rims on hn
588152	5330722	11	MB97-19-1207.4	msv		metabasite(hn mporph)	plg-hn^{r})-act	qtz-wm-bt-cht	tit-cb-m/z	act often prismatic, bt is grn
586834	5331157	71	AN96-01-929.0	ipo aggs, cht	cb?	cht phyllite (hsz)	cht-op	cb-plg-qtz		ipo wraps polygd qtz, enough cht for 41?
586182	5331460	22	AN97-09-2449	mpo agg, wm	cb	bt metaclastite	plg-qtz-bt-cb	op-cht	ap(dk cores)-m/z	rounded to euh fp, is cb pre-meta alt?
586216	5331548	22	AN97-09-3069	mpo bt, agg	cb	bt metaclastite	plg-kf?-bt-cb	cht-qtz	op-ap	lithic clasts and crystals, cbalt pre-/syn meta?
586396	5331439	31	AN03-35-431.5	ipo agg, ru		metaultramafite	wm(tlc)-cht-cb		op-ru	ru prom, if wm=ms rk is 71, is ru typic of umaf
586795	5331551	41	AN03-38-527.5	ipo wm cht cren		mica-rich metaclastite	cht-wm-qtz-fp-cb		op-ru	transitional l to 21 or 71?
586997	5331327	71	AN03-38-903.5	ipo chtwm, agg		phyllite	qtz-plg-wm-cb-cht		op-m/z	transitional l to 71?
587014	5331382	41	AN03-38-1214.5	ipo		phyllite (hsz)	cht-qtz-fp-wm-cb		op	transitional to 71
587028	5331427	11	AN03-39-75.0	msv		metalamprophyre	btr-am(cls)-cb-fp-		op-m/z-tit-ru-ap	ragged bt edges, bt replaced by am
586920	5331060	22	AN03-43-157.4	mpo agg, bt		bt-cb metaclastite	cb-qtz-plg-bt	cht (part aft bt)	op-ru-m/z-ap	metalamp, bt grade hsz/alt zone?, ru with cht,
586420	5331525	11	AN03-49B-1276.	mpo aggs		metalamprophyre?	epg-am	bt$^{r?}$-cb	ap-op	unsure about origin
586599	5331490	62	AN03-53-227.5	msv		meta-alkalic ign rk	fp-bt	cb-cht	op-tit-m/z	bt agg aft bt, bt+cht OK, fp likely plg and kf
586795	5331551	22	AN03- 57-891.1	ipo agg am, bt		act-bt metaclastite	plg-qtz-bt(grn)-act	cht-cb	op-tit	
523767	5368750	11	SD-00-001			metabasite plg-rich	plg-cht-act-wm	epg-tit	op	wm-cht-epg after plg
524816	5367648	10	SD-00-002			metadiabase?	cpx^{r}-plg	blgrn-brn am	bt-op-cht	am is metamorphic or late igneous?
522956	5370422	32	SD-00-005			metaultramafite	am	cht-un	op	un is higher relief aggregate
511162	5386463	31	SD-00-008			metaclinopyroxenite	cpx^{r}		plg-cht	cht only sign of metamorphism
511229	5386309	21	SD-00-009			plg metaporphyry	plg-cht-qtz	un		negative elongation un in vein
512704	5387637	11	SD-00-011			metabasite	cpx^{r}-plg"	cht-act-epg		epg-cht aft most plg,
512877	5388055	11	SD-00-012			metabasite	cpx^{r}-plg(epg-cht-act)	cht-act-epg		some cht grn NS, brn EW
512792	5388563	11	SD-00-013			metabasite	plg(cht)-epg	qtz		no act, some brn epg

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
523561	5390501	11	SD-00-014	mpo		metabasite	cht-epg-plg	cpx^r-tit-cb		no act, igneous cpx has augen shape
523513	5390352	1	SD-00-015			metabasite	cpx^r-act-cht-epg	cb wm		
523509	5390305	11	SD-00-016			metabasite	cpx^r-cht	epg-tit(fuzzy brn)	qtz	no act
523504	5390175	11	SD-00-017	wpo		metabasite	cpx^r-plg-epg-cht		tit-op-act	epg-cht after plg
521193	5392122	11	SD-00-018			metabasite	plg'-cht-tit	ep-wm	qtz-op	no act
524158	5392134	11	SD-00-019	msv		metabasite	cpxr-cht-epg	tit(fuzzy)	cb-plg-op	no act
528489	5387229	11	SD-00-021	veins		metabasite	act-epg-cht-plg	fuzzy tit	op	cht-cb and epg-qtz veins
526800	5389396	11	SD-00-022	wpo		metabasite	act-epg-cht-plg-cpx^r	tit(fuzzy)	op	epg is brownish, Biref not anomalous
525738	5388900	11	SD-00-023	msv, veins		metabasite	act-epg-cht-plg	op		
525090	5388427	11	SD-00-024	msv		metabasite	act-epg-cht-plg	op		
525107	5387731	11	SD-00-025	msv, vein		metabasite	act-epg-cht-plg		cb-op-tit(fuzzy)	discontinuous cht-epg vein and patches
520329	5386787	71	SD-00-026			meta-cbaltd basite	plg-cb			too fgr, possibly subgreenschist
520325	5386977	21	SD-00-027			fels lapilli metatuff	plg-qtz-wm	epg	cht	
520357	5387128	11	SD-00-028			metabasite amygs	cht-cb	epg		cht amygs w/ tiny epg, cht-cb amygs too fgr
520365	5387255	11	SD-00-029			metabasite	act-cht-epg-cpx^r-op	stp ap		spectacular stp PHOTO OP
521172	5387265	11	SD-00-030	mpo		metabasite	epg-cht-act-tit	cpx^r-op(fuzzy)		moderately intense preferred orientation
521908	5386159	11	SD-00-031	mpo		metabasite	cht-epg-act-plg	tit(fuzzy)-cpx^r		mpo is act and cht aggregs
522413	5387397	11	SD-00-033			metabasite amygs	plg too fine-grained	cht-cb-epg amygs		too fgr to ID main minerals, amygs OK w/ 11
522471	5387841	11	SD-00-034	mpo		metabasite amygs	act-op	epg-cht-plg?		cht-epg-act amygs OK with 11, matrix too fgr
522287	5388038	11	SD-00-035	wpo		metabasite	act-epg-cht-plg	cb		very fine-grained
522276	5388043	11	SD-00-036	ipo		maf mhyaloclastic brx	cht-epg-(glass)	op-act		clasts and cht aggregates define pref orient.
548281	5385906	11	SD-00-038	msv	mcb	metabasite(intm?)	plg-op	act-cb-cht-epg-op		
548264	5385893	11	SD-00-039	act-qtz vn		metabasite(intm?)	plg-act-cht	qtz	op-tit(fuzzy brn)	
548082	5385946	11	SD-00-040	wpo		mafic metaclastite	qtz-plg-act-su	cht-epg	tit	chemical sed?
549295	5386683	11	SD-00-041	msv		metabasite(diab?)	cpx^r-plg^r	cht-am(blgrn)	epg-op	interstitial cpx mainly untouched
549222	5386589	32	SD-00-042	msv		metaultramafite?	cpx^r-am-tlc?-op			wm = tlc?, photo op; ragrde=11 also possible
547113	5385712	11	SD-00-043	msv		metabasite (diabase?)	cpx^r-plg^r	cht-epg	op-tit	grn to brn cht, epg aft plg,
546515	5385054	11	SD-00-044	msv		metabasite	cpx^r-plg^r	cht-am-epg	op-tit	
546469	5384446	11	SD-00-045	msv		metabasite	plg-2am	op-cb-qtz	cht	2am = ylgrn-blgrn, clss-blgr, cb in amygs
544397	5384226	11	SD-00-046	msv cb-un vn		metabasite(plg-rich)	plg-cht-op	epg		plg microlites, no act, cb-cht vn too
541544	5385351	71	SD-00-047	mpo agg		cb-cht schist/mumaf?	cb-cht-op-plg		wm(tlc?)-qtz-plg	defm is post cb
542500	5387917	11	SD-00-048	msv		metabasite	cpx^r-plg^r	cht-epg-act	op	vgr ID incomplete, unsure about 11, 10?
541623	5358386	11	SD-00-050	msv		metabasite(diabase)	cpx^r-plg^r	op-cht-epg-wm		wm aft plg, cht aft ?, vfgr
543231	5356174	12	SD-00-051	msv		metabasite	2am-plg	tit-op-wm	qtz-epg	hn + act(blgrn), qtz in matrix + vn
551163	5360136	10	SD-00-052	msv		metabasite	cpx^r-plg^r-cht-epg	wm	op(fuzzy)-op	no act, 10?
550956	5358693	12	SD-00-053	msv		metabasite	2am-plg	epg-wm-cpx^r-cht	tit(fuzzy brn)-op	cpx inside am, plg not healthy

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
549509	5358498	12	SD-00-055	wpo some am		metabasite/chem sed	am(acic, twnd)-plg	epg poiks-qtz		most am random orient, unsure 12 or 52
549494	5358516	11	SD-00-056	msv		metabasite	cpx^r-plg	am-cht-epg		am blgrn to clss, lots of ig cpx
550931	5360515	10	SD-00-057	msv		metabasite	plg-epg-act-cht	op-fuzzy un		vfgr ID uncertain, NB fuzzy un, 10 possible
550905	5361005	11	SD-00-058	msv		metabasite	cpx^r-plg	cht-epg		epg-cht interstit, cpx in good shape, 10?
550879	5361601	11	SD-00-059	msv cht-cb vn		metabasite	cpx^r-plg	epg-cht-act	op	not much act, could be contact zone
549271	5360922	11	SD-00-060	msv		metabasite	cpx^r-plg	cht-epg-op/tit		no act, plg not healthy, 10?
552800	5364970	11	SD-00-061	mpo pebs, cht		heterolith volc peb mcg	plg-cht-epg	act-op-qtz		flattened pebs
551700	5365780	11	SD-00-065	msv		metabasite	cpx^r-plg" (wm-epg)	cht-epg-op-tit		tit rims on op, no act
547471	5365242	11	SD-00-068a	msv		metabasite	plg(partly altd)	cht-act-op		op fuzzy brn, ts too thick?
546825	5365319	11	SD-00-069			intm metaporphyry	plg-act(yel-blgrn)	cht-epg-qtz-wm	op-tit-ap	wm inside plg phenos
547306	5368311	12	SD-00-070	msv, act-qtz vn		metabasite	plg-2am	epg-qtz-op-wm		wm aft plg, act in vein, vn is syn peak meta
547161	5367320	11	SD-00-071	msv		metabasite	cpxr-plg(part to wm)	cht	bt-op-tit-epg	NB bt, wm aft plg, no act, cht aft ?
544165	5367241	12	SD-00-073			metabasite	am-plg	op	epg-cht-qtz	lower 12, plg to wm, am colour variable
545751	5366665	62	SD-00-074	msv		Na-am metagranitoid	plg-kf	2am(plgrn, bl-vio	tit-qtz-epg	un in core of plg, Na am, bl-violet,
545655	5367121	62	SD-00-075	msv		Na-am metagranitoid	plg(-ve)-qtz	cro mats, rims	tit-epg-op-ap-wm	wm aft plg, crossite acic agg and as rims
544511	5368726	11	SD-00-076			metabasite mporphyry	plg-act-epg-qtz	cth-cb		qtz in amygs, vn; NB epg zone
545612	5369738	11	SD-00-077			metabasite(anorthos?)	plg-act	cht-epg	op-tit	plg not healthy, could it be metaanorthosite?
545075	5368048	12	SD-00-078			metabasite	act-hn	epg-cht-plg-op		plg parly altd, ts too thick?
537341	5368787	13	SD-00-095	ipo hn		metabasite	hn-plg	op-epg	qtz-cb	defm at az grade, small hn wrap hn augen
537417	5368852	13	SD-00-096	mpo hn, agg		metabasite	hn	plg-qtz-op-tit		ragged, "fibrous" hn
537631	5368846	12	SD-00-097	mpo, hn, agg		metabasite	hn-act	op-plg-epg-tit-cht		defm at tz grade here
538159	5368752	11	SD-00-098	msv		metabasite	plg-cpx^r	amr-wm(aft plg)	op-cht-epg-cb-bt	bt relict?, cpx good, plg not healthy, no act
538546	5368810	11	SD-00-099	msv		metabasite	plg-act-op	cht-qtz-tit(fuzzy)	epg	whole ts is fuzzy
541526	5371408	11	SD-00-100	mpo agg		metabasite	plg-cht-act	epg-op-hn^r		Plg not healthy
542994	5369751	11	SD-00-101	cht vein, fracts		metabasite (diabase?)	cpx^r-plg		act-cht	much wm in plg, cht seams, own with act
542520	5370893	11	SD-00-102	msv		metabasite	am	plg(lots wm)	op-cht-epg-wm	uppermost 11
533167	5369528	12	SD-00-103			metabasite	act-hn-epg-plg-op	cht-wm(aft plg)	ap	am is patchy act to actinolitic hn, epg aft plg
531216	5378261	11	SD-00-104	msv		metabasite	epg-"plg"-act-cht	un(length fast)	op-cpx^r	could be subgreenschist
513782	5389365	10	SD-00-121			metabasite?	plg-cht-epg	cht-act-prehnite?		prehnite possible in amygs, strange rk
511524	5386617	10	SD-00-123			metabasite(gabbro)	cpx^r-plg^r?(grybrn agg)	un (fuzzy agg)	cht	un and cnt possible metamorphic minerals
511521	5386635	10	SD-00-124			metabasite(gabbro)	cpxr-plg"-un(aft plg)	cht(late)		unsure about 10, younger diabase?
511520	5386666	21	SD-00-126			fels heterolith mcgl	fp-qtz-cht	wm	tit?	unsure about grade
512677	5387106	31	SD-00-129			metaultramafite	se-cpx^r	op		
505191	5365134	21	SD-00-161	mpo cht, agg		qf schist/metaclastite	qtz-plg-cht	tit	op-wm	
506343	5367213	71	SD-00-162	mpo cht, agg		metaclastite	cb-qtz	cht-tit?-epg?	wm	
506951	5369491	11	SD-00-163			metabasite	act-epg-cht	plg	tit	

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
505474	5372771	71	SD-00-196	w-mpo cht	cb/wm	meta-altd basite	plg-cb-cht-wm			
505425	5375890	21	SD-00-197	mpo		metawacke	wm-qtz-plg	cht	op-cb-to-z/m	
552691	5371531	72	SD-00-199	msv		cb-phlogopite rock	cb	phlog-op	cht-plg	metaclastic rock?
552331	5371688	61	SD-00-201	mpo agg polygd		metagranite	plg-qtz-kf	wm-epg	op-cht-bt'?	wm-epg-cht=meta, polygd qtz-fp
553539	5373017	21	SD-00-218		wm/cb	metaclastite	wm(aft plg?)-cb-qtz	cht	epg(tiny prisms)	plg altered to wm by pre/syn meta alt
609758	5344508	21	SD-00-250	msv	wm/cb	metafelsite	plg-qtz-cht-wm	cb	op	wm/cb alt of plg phenos
609402	5336236	22	SD-00-251	mpo matrix		felsic metaclastite	plg-qtz-wm-cht	cb	bt-op-tit-epg	oxidized cht in matrix looks like bt
608587	5336262	21	SD-00-252	wpo	cb	felsic metaclastite	plg-qtz-cht-cb-wm		op	cb alt pre/synmeta?, cb rhombs look later
607429	5336772	10	SD-00-253	msv		metabasite	epg-un(fuzzy gry)-cht	epg-op-cpx'	act	possibly 10 even with act?
605983	5336468	10	SD-00-254	mpo plg		metabasite	plg-cb-cht-wm	op		cb alt pre/synmeta?, or very low grade
605559	5337354	71	SD-00-255	defm/alt zone	cb	metabasite	epg-cht-act-cb			epg-cht-act to epg-cht-cb with extens fracts
605571	5338531	71	SD-00-256	ipo hsz	cb	cb-cht-qtz schist	cb-cht-qtz		ru-op-bt?	mpo=cht, agg "bt" could be oxid cht
603729	5335877	11	SD-00-257	msv		metabasite	plg)-act	epg-cht	op-qtz-tit-wm	plg partly to epg-cht-wm
608183	5332963	20	SD-00-259	msv		metaclastite	plg-qtz-cht		wm-op-tit	very low grade possibly
606353	5333140	10	SD-00-260	msv		metabasite	cpx'-plg(not healthy)	epg-qtz		
603467	5331252	41	SD-00-262	mpo wm, agg		wm-qtz-cb schist	wm-qtz-plg	cb-cht	op	metasedimentary rock
602270	5330906	71	SD-00-263	msv	cb?	cb-cht rock (metalt?)	cb-cht		op-qtz-epg	possibly metamorphosed alteration
591239	5329064	11	SD-00-264	fldd vein (act)		metabasite	act-cht-epg	plg-qtz	op	folded qtz-cb-act vn, mostly act rock
583632	5341916	10	SD-00-266	msv		metabasite	plg	cht-epg-un	prn/ epg?	plg going to un grybrn agg, prn or epg in amyg
596507	5330790	41	SD-00-267	mpo	wm	wmaltd metaclastite	wm-qtz-cb-"plg"	cht	op	cb as clasts, wm aft plg, alt=pre/syn meta
598595	5333239	21	SD-00-268	msv	cb-wm	metafelsite (maltd)	plg-qtz-wm-cb	cht	op	metamorphosed cb-wm altd vlclastite
599865	5335912	11	SD-00-269	msv		metabasite	cpx'-plg"	cht-epg-act	op-qtz	much plg gone to epg
599682	5338204	10	SD-00-270	veins, vfgr		metabasite (amygs)	epg?, fuzzy brnish	epg-cht-cb-qtz		veined, prom brn mineral is epg-like
600002	5339965	11	SD-00-271	msv, defmd vn		metabasite	plg(much to wm)	act-cht-epg	op	plg in bad shape
599703	5342225	10	SD-00-272	mpo, ext vns		metabasite	epg-un(gry-brn)-"plg'	cht-cb-qtz		probably 11 due to degree of defm
595131	5326885	71	SD-00-274	mpo wm cht		cht-wm-cb-qtz schist	cb-qtz-wm	cht	ru(lots)-op	hsz/altzone, cb has rusty edges
596415	5325499	11	SD-00-275	hsz ipo act		metabasite	act-epg-plg-cht	op	qtz wm aft plg	intense strain at greenschist zone grade
596559	5323142	22	SD-00-276	m		lithic metawacke	plg-qtz-bt-cb	cht-op	mz/zi	bt obiq/II fln cb clasts
597919	5320400	12	SD-00-277	w II bdg		mafic metatuff	epg-act-hn-plg	cht-op	tit	clasts of hn?
597125	5317667	11	SD-00-278	m cht-act fln		mafic schst	act-cht-epg-tit	op-plg	qtz	brn epg? +reg
594493	5316877	12	SD-00-279	msv		metabasite	act-hn-epg-plg	cht-tit-op-qtz		hetero txt
507034	5310483	20	SD-00-282			fgr metawacke	wm-qtz-plg			detr wm cht? Probably 20
523561	5310017	11	SD-00-283	msv		metabasite db	plg(wm)-cpxr-op	cht-hnr		wm alt of plg
520326	5308583	20	SD-00-284	msv		mafic metawacke	un-plg-qtz-cht?	op	wm	proteroz?
522849	5309791	40	SD-00-285	w + bdg		metamudstone	plg-qtz-wm-un	cht-op		SG Proteroz?
525144	5309511	11	SD-00-286	w, Sm, Sl		metabasite	epg-act-cht-tit	op-plg-qtz		Sm w/ spaced Sl

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
550981	5316281	60	SD-00-287	msv		meta?deut? Tonalite	qtz-plg	bt-epg	op-tit-ap-un-cht2	gry bulges in bt, cht2 after bt, deut or meta?
560291	5325499	71	SD-00-288	m cht-wm vn		metabasite	plg-cht-ip	wm-cb		not umaf, cb in vein too
559822	5323128	12	SD-00-289	m		metabasite	blgrn am-plg-epg	op-cht	cb-tit-m/z	pref orient am, lower 12, heterog txt
555811	5320096	61	SD-00-290	w		meta? Granodiorite	plg-qtz-kf	am	cht-wpg-wm-tit	bt gone to cht, wm in plg, qtz weakly straind
548313	5326548	20	SD-00-291			metasiltstone	qtz-wm-plg?		wm'-tit-cb	detrital wm
545257	5332283	61	SD-00-292	w polyg qtz		metagranodiorite	plg-qtz-kf	cht-bt	op-tit-ap	cht after meta bt
545054	5337287	61	SD-00-294	w polyg		metagranite	plg-qtz-kf	cht-epg	(hn-bt)r-tit	cht-epg afte bt-hn
546208	5337983	61	SD-00-295	w polyg		metagranite	plg-qtz-kf	hn	cht-epg-tit	possibly 80
547194	5345047	20	SD-00-296	msv		fgr metawacke	qtz-plg, matrix	cht	epg-am	detr am, epg? Prot?
548744	5349694	20	SD-00-297	fltd bdg		metamdst/sltst	qtz-plg-wm-cht	op		vfg, Prot?
551204	5354109	11	SD-00-298	msv		metabasite	plg-hnr-plg (wm)	act-cht-epg	op	12 if hn not relict
555349	5355154	13	SD-00-299			metabasite ampb	hn-plg-op	wm (plg)	ap-mz/zi	ragged txt
555349	5355154	21	SD-00-299b	m polygd		metafelsite/qtz vn	qtz>plg	op-stp-cht-cb		stp-cb vn
553940	5354769	61	SD-00-300	polygd qtz		metagrnt/grdt	plg-qtz-kf	hn	tit-epg-cht-op	epg-cht meta or deut
555351	5352344	12	SD-00-301	msv		metabasite	(hn-cpx)r-act-plg	op-wm(plg) epg	ap	plg unhealthy
555278	5341323	11	SD-00-303	msv		metabasite	act-wm(plg)-epg-cht	op-tit		vfgr id uncertain
554113	5339916	11	SD-00-305			metabasite	act-epg-cht (?)	plg		vfgr id uncertain
558023	5338507	11	SD-00-306			meta maf hyalclte	cht-epg-act	op-cb		photo op
556244	5334370	11	SD-00-307	msv	m cb	mbasite cb-cht vn	cht-epg-qtz-act			meta-alteration
557566	5331264	11	SD-00-308	msv		metabasite	cht-epg-plg-op	fuzzy tit		no act
559732	5327878	20	SD-00-309	msv		metawacke	qtz-plg-kf	cht after?	m/z (bt-wm)r	detr bt cht Prot?
530077	5341937	10	SD-00-311	msv		metadiab?	cpx-plg	wm (plg)	cht-am-bt m/z	10? Deut?
530104	5341853	12	SD-00-312			metaandesite	plg-qtz-hn	epg	cht-wm	close to 13, cht late?
527029	5341555	80	SD-00-313			granodiorite	plg-qtz-kf	hn wm in plg	cht-epg-tit	cht-epg meta? 61?
526283	5341084	62	SD-00-314	msv		metagranodiorite	plg-qtz-kf		act-cht zi-tit	reaction rims
520656	5339324	61	SD-00-315	qtz strained		metagranodiorite	plg-qtz-kf-bt		wm-cht-epg2	bt not happy
523571	5339997	61	SD-00-316	rexlized		metagranodiorite	plg-qtz-kf (micro)	hn-bt		hn ok bt not ok 61?
542176	5330915	61	SD-00-317	msv		porphyritic mgrdt	plg-qtz-kf-cht	epg-op-tit	ap-btr-m/z	heterogeneous txt
577231	5338397	11	SD-00-318	msv	m wm	metabasite	plg'-am-epg-cht-wm-cb	op-tit		wm after plg 12?
574615	5339741	11	SD-00-319	m-l Pshad	m cb-cht	metabas-metamin	plg-cht-cb-op	epg		71, cht-qtz Pshads on op
570505	5341114	11	SD-00-320	msv cb-epg vn		metabasite	act-plg-cht-epg-op	qtz-cb		
570466	5341680	11	SD-00-321	msv		metabasite no act	epg-cht-plg	qtz-op		no act
571147	5344894	11	SD-00-322			metabasite no act	plg-epg-cht	op-cb		length fast wm in vn, ep-rich zone, no act
574487	5345940	10	SD-00-323		?wm/ plg	metabasite no act	un-cht-wm-epg?	op		sgz or altd?
573606	5340271	10	SD-00-324	msv		metabasite no act	plg-cht-epg-un?	op-cb		too fgr, cht-cb amygs

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
573464	5337730	71	SD-00-325		i cb	altd metabasite	cb-cht-un	op		ghosts of igneous txt
571663	5335554	11	SD-00-326	msv		metabasite	cht-plg-epg-act	hn′-op	qtz	12 or 13 if hn is not relict
569928	5334403	11	SD-00-327	msv		metabasite no act	cht-cpxr	epg-plg′-op	qtz	is it all cpx?
573477	5334553	21	SD-00-328	w		metawacke	plg-qtz-wm-cht-cb		op	rexl but no flattening
576764	5334633	21	SD-00-329	m		metawacke	plg-qtz-wm-cht-cb		op	foliation, no clay matrix
577465	5334226	21	SD-00-330	msv		metawacke	plg-qtz-wm-cht-cb	op		recrystallized
586455	5331202	11	SD-00-332	w		metabasite	plg-qtz	act-epg-cht	op	OK for 11 but andesitic
579141	5334197	71	SD-00-333	msv	m cb	altd intm mvolcanic rk	plg-cht-cb	qtz-wm-op		
567212	5329134	11	SD-00-334	msv	wm/ plg	metabasite db? no act	cpx′-'plg'-wm-cht	epg-op		diabase?
569593	5332154	21	SD-00-335	msv	wm/ plg	metawacke	plg-qtz-wm-cb	cht	op	
567733	5332246	21	SD-00-336	w		mafic metagreywacke	cht-plg-qtz-cb-op	wm (plg)		su-rich mbasite, mafic metatuff?
565811	5331866	72	SD-00-337	m		schist	cb-cht-op-plg	qtz	bt	high strain zone, how did bt grain survive?
566269	5328107	62	SD-00-338			metalamprophyre	bt-am-plg	op	cht2-m/z	bt replacing am in part, local cht after bt
563527	5327887	71	SD-00-339	m vn disruptd	i cb cht	altd metabasite	cb-op--cht-plg			
560412	5327066	21	SD-00-340		cb vns	heterolithic mcgl	plg-qtz-cht-wm	cb		lots cb
554381	5331223	11	SD-00-341	msv		metabasite	cpx′-'plg'-cht	epg-act-op		plg gone again, not much act
558220	5334519	11	SD-00-342			metabasite no act	cpx′-cht-'plg'	op	epg in amygs	not used to all this fgr cpx, 10?
553684	5333724	11	SD-00-344	msv		metabasite	cpx′-wm-cht-epg	qtz	op	wm after plg
553849	5335043	11	SD-00-345	msv cht vns		metabasite	cpx′-plg-	cht-epg	op	too fgr
557718	5324029	11	SD-00-346			metabasite	act-cht-plg	epg-qtz-op-tit	op	act rather dark coloured
554960	5323648	11	SD-00-347			metabasite	epg-cht-op	stp-qtz		epg is brownish, stp!
553106	5323575	11	SD-00-348	w		metabasite	act-cht-epg	op-plg	qtz	
568278	5317998	62	SD-00-349	m gsr		alcalic metagranitoid	cpx′-kf	tit-act-cht		act-cht after cpx
562912	5324375	62	SD-00-351	w		metalamprophyre	bt-am	op-plg?	cb-tit-m/z	am colourless to pale grn
560590	5326779	71	SD-00-352	msv cht seam	i cb-cht	altd metabasite	cht-cb-plg	op-tit		
555415	5318830	11	SD-00-353	w		metabasite	act-cht-plg	op-epg		vfgr Subgreenschist grade?
518457	5346081	11	SD-00-354			metabasite(intm)	plg-qtz-am	cht-wm-tit-op-ap	kf	nicely recrystallized, am clss to plgrn
518448	5346093	22	SD-00-355	mpo		hn metawacke	qtz-plg-hn		op-cht2-tit	locally looks like 13 but too much qtz
521742	5344778	11	SD-00-356			metabasite (diabase)	cpx′-plg′-cht(aft ?)	am′	act-stp	with act not SG
520537	5349139	13	SD-00-358	w-mpo hn		metabasite(intm)	hn-plg-op	qtz		blgrn to olgrn hn
523867	5348369	62	SD-00-359			metamonzodiorite?	plg-hn	act-wm-epg		not amphibolite, plg unhealthy
516533	5348179	22	SD-00-360			bt metawacke	qtz-plg-hn	bt	epg-wm2-cht2	22 + 21 overprint, wm aft plg, cht aft bt
516198	5347978	62	SD-00-361	polygd rexl		bt metagranite	plg-qtz-df	bt		could be 80 or rexl at bt grade (62)
514239	5348552	61	SD-00-362			bt) metagranodiorite	plg-qtz-kf	bt	tit-epg-wm-cht	epg-wm-cht assumed to be metamorphic
510635	5349170	61	SD-00-363	polygd qtz		metagranodiorite	plg-qtz-kf-hn-cht			ign bt replaced by metamorphic cht

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
507952	5350066	61	SD-00-364	mortxt, plygd qz		metagranodiorite	plg-qtz-kf	hn-epg-cht(aft bt)	tit	ign bt replaced by metamorphic cht
510367	5346038	61	SD-00-365	mortxt, plygd qz		metagranodiorite	plg-qtz-kf	hn-cht(aft bt)	epg	partial epg rims on hn
510164	5343974	61	SD-00-366	polygd qtz		metagranodiorite	plg)-qtz-kf	hn-epg-cht(aft bt)	tit	lots of wm aft plg, defmd qtz
514553	5339603	61	SD-00-367			metatonalite	plg-qtz-am-bt		allanite	bt not so much chtized, pale am variable colou
516414	5340510	61	SD-00-368			am-bt metawacke	qtz-plg-am-bt	op		am is not hn
509205	5317724	71	SD-00-370	msv, veins	cb-cht	cb-cht altd metabasite	cht-cb-plg-op-epg			too fgr, cht-cb veins
506379	5313240	10	SD-00-372	veins	poss-ibly	metabasite	un-plg	cht-qtz-op		unknown in veins, fuzzy brn-gry un
498658	5319912	20	SD-00-373			vlow grade msdst	plg-qtz-cht		op wm?	lithic pebs xls
500360	5322928	10	SD-00-374	sz, cht seams		metabasite	cpx′-plg	cht-epg-tit	op	
503124	5320172	11	SD-00-376	msv		metabasite	act	cht-epg-plg-op	fuzzy tit?	lots act
503728	5322947	22	SD-00-377		wm/ plg	felsic metaporphyry	plg-qtz-wm	epg-cht-bt	op	epg-wm zone
504707	5325034	11	SD-00-378			metabasite amygs	plg-cht-epg	op-wm(plg)	act-cht zi-tit	cht-epg amygs act just getting going
502786	5326484	11	SD-00-379	msv, vein	cht vn	metaclastite vlcl	plg-epg-qtz	cht	act-op-tit	mafic clasts, brn and clear epg
506675	5321392	12	SD-00-380	msv		maf plg metaporphyry	act-hn-plg-qtz	cht-bt-op-epg		
507598	5318486	12	SD-00-381	wpo		metabasite	am(hn?)-plg-op		cht-epg-qtz	am is hn colour but gz texture
510503	5318877	61	SD-00-382	msv		metatonalite/diorite	plg-qtz-epg-wm	op-tit	cb-ap	metaigneous intermediate compo
512123	5317291	61	SD-00-383	msv, cb vn		metatonalite	plg-qtz-wm-cht	epg	op-cb	metagranitoid
514828	5316752	71	SD-00-384	msv	cb-cht	cbaltd metabasite	cb-plg-cht-wm	qtz-op		relict amygs
514700	5317426	71	SD-00-385	msv	cb	cbaltd metabasite	cb-plg-cht-wm	op		
515901	5325261	11	SD-00-386	msv	wm	metabasite/andesite	epg-cht-wm-tit	qtz-plg-op		too fine-grained
514843	5324074	71	SD-00-387	msv	cb	cbaltd metafelsite	cb-plg-qtz-cht	wm	op	
514605	5322860	71	SD-00-388		cb	metaclastite cbaltd?	cht-cb-plg	wm		
513453	5320883	11	SD-00-389	msv		maf metaporphyry	plg-cb-cht-wm		cb feathers epg	no act, subgz? Cht pseudos, plg phenos
515870	5315358	62	SD-00-391			alkalic metagranitoid	kf-ab	crs-stp-b″-qtz	op tit ap hn′ cb	grybl to mauve am, bt′ to am + stp
519193	5316840	71	SD-00-392	cb-cht vns	cb-cht	cbaltd metabasite	plg-cht-cb			too fine-grained
521516	5316006	21	SD-00-393	mpo, sz		metawacke	wm-qtz-plg	cht-epg	op	qtz vns w/ cht sz, some wm alt?
523105	5316550	21	SD-00-394		wm	wmaltd metawacke	wm-cht-qtz	op cb(rusty)	to	
522620	5314371	11	SD-00-395	msv, fracts		metabasite	cpx′-plg-op	cht-epg-blgrn am	hn′	plg unhealthy brn, cht grn to pale brn
522960	5311921	11	SD-00-396	wpo		mconglom/brx	plg-qtz-cht-act	cb	tit-op	mafic clasts, matrix act dk blgrn,
527468	5309951	40	SD-00-398			metamudstone	wm-qtz-plg-cht?		detrital cht bt	SG vfgr matrix
527978	5310239	51	SD-00-399a	mpo		meta-iron formation	su-qtz	cht-stp-cb		
532787	5308981	61	SD-00-400	mpo gsr		metatonalite	plg-qtz	hn-epg-cht	tit-ap-op-m/a	bt gone epg + cht metamorphic
530405	5311040	11	SD-00-401	mpo epg vn		metabasite/andesite	plg-act	cht-tit-qtz	epg	many am grains oblique to mpo
527701	5323146	11	SD-00-402			metabasite/andesite	plg-act-epg(brn)	cht-qtz-tit		rexl qtz amygs PHOTO OP
527704	5323136	19	SD-00-403			meta?diabase	cpx′-plg′	btr-wm-cht		cht aft bt, wm aft plg, a metamorphic event?

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
528841	5321618	32	SD-00-404	msv		metaultramafite	wm(tlc probab)-cpx'	op-cht	bt	NB bt and wm must be talc to be mumaf
529277	5318793	62	SD-00-405	bent rexl fp		metasyenite	kf-ab	Na-am qtz	bt-tit-ap-cb	Na-am aggreg aft cpx? See 03BRB-435, 436
529628	5315483	62	SD-00-406	msv		metamonzonite?	afp-ab-kf	bl to gry am	tit-qtz-bt-op	am zoned, better rexl than 405
529567	5313625	61	SD-00-407	m mortar txt		metaquartz monzonite	afp-qtz	cht-tit-epg-op	m/z	
542312	5317863	20	SD-00-408	no fabric		qtz-rich metawacke	qtz-plg-kf?	cht	wm	Proterozoic Gowganda?
539841	5317407	20	SD-00-409	no fabric		sandy metamustone	qtz-plg-kf-wm-cht			very fine-grained, Proterozoic Gowganda?
535357	5314914	71	SD-00-410		cb-cht-su i	altd metabasite	cht-op-cb-wm			intense cb-cth-wm-su alteration, ex plg micls
535431	5321435	62	SD-00-413	m mortar txt	cb-wm	chtaltd metagranite	kf-qtz	cht-bt-op-epg	tit-op	bt-wm-epg aft am Cairo Stock
533465	5321302	62	SD-00-414	w	cb-wm w	metasyenite	afp	bt-cb-op	ap	
534884	5319357	62	SD-00-415	w		metasyenite	afp-qtz		bt m/z	very little mafics Cairo stock
565916	5326836	11	SD-00-417			metabasite/andesite	act-qtz-plg	cht-cb-tit	bt-op	random am Cairo Stock
565034	5324874	62	SD-00-418	m fin polygd		metaquartz syenite	afp-qtz	cpx'-bt'	am ap m/z	metam am rare, defmd, Otto Stock
568317	5321580	80	SD-00-420			qtz syenite	afp-qtz	cpx-am	tit-op	Otto Stock no evidence of metamorphism
568416	5320052	62	SD-00-421	m gsr mort txt		metasyenite	afp-qtz	blgrn-mauve am	tit fibrous am ap	fibrous am and strain evidence of meta ott st
570240	5320193	61	SD-00-422	?		metaquartz monzonite	afp-qtz	aeg-(bt)-cht	tit-cpxr-am-ap	<1% m/z, cht aft bt meta or local alt? Otto Stk
572583	5320200	62	SD-00-423	annealed?		metaquartz syenite	afp-qtz	aeg	am	assume am prisms on cpx are metamorphic
574140	5319826	12	SD-00-424	mpo am		metabasite	hn>act-epg	tit	qtz-op	close to 13
573635	5317382	21	SD-00-425	ipo		metawacke	qtz-plg-wm-epg	cht	op	relatively high grade for this suite so far
573289	5315919	62	SD-00-426	gsr, augen		metatonalite	plg-qtz	bt (some rexl)	epg-wm	bt is stable, qtz annealed
569344	5329291	11	SD-00-427	rexl qtz vn		metabasite, cpx diorite	plg-cpx'	act-cht-op	bt' tit ap	cht after bt, thick slide
570031	5327336	11	SD-00-428	mpo, epg vn		metabasite	act-cht-epg-plg	cht-qtz		
579622	5324333	52	SD-00-429	rexl qtz vn		meta-iron formation	qtz-op	gru-cum	cb-grt	note garnet in iron formation
579498	5324244	52	SD-00-430	fldd lyr		meta-iron formation	op-qtz	gru-cum		nicely recrystallized
579503	5324226	12	SD-00-431			metabasite	hn>act-epg	tit	op	slide too thick, cht?
577883	5323637	11	SD-00-432	msv	K	metabasite w/ bt	act-bt-cht-plg	qtz-op		pre-meta K alt?
576092	5323852	12	SD-00-433	msv		metabasite	act-hn-plg-epg	op	qtz	is hn relict so grade is 11?
574029	5324613	12	SD-00-434	m mpo		metabasite	hn-epg	plg	cht-tit-bt-m/z	hn-epg but cht still present
572071	5324620	62	SD-00-435	w polygd		alkalic metagranite	afp(per-ab-microcl)	cpx'-am-act-qtz	tit'-tit-bt-ap-op	<1% m/z, blgry-mauve am, act aft cpx photo
573282	5322179	62	SD-00-436	w polygd		alkalic metagranite	kf-plg	Na-am qtz	titr-tit-bt-m/z	am aft cpx, polygd fp, no po, PHOTO OP
575857	5317264	61	SD-00-437	i, gsr, augen		metatonalite	plg-qtz	epg-wm	bt-op-cb-m/z	nice eg of mgrtd PHOTO OP
579887	5317906	11	SD-00-439	mpo		metabasite	am-epg-cht-plg	qtz	stp-op-tit	good fabric, am dark NB stp
582587	5317233	71	SD-00-440	mpo	cb?	metabasite	cht-epg-cb	op-plg-qtz	stp-op	possibly subgreenschist
585119	5317693	41	SD-00-441	w	m wm	wmaltd metabasite	wm-cht-op-plg	cb-qtz-tit?		wm after plg
582759	5314887	41	SD-00-442	ipo		mafic schist	cht-plg-op(fgr, cgr)	qtz		metabasite possible
582985	5311310	61	SD-00-444	ipo, gsr, augen		metagranite	qtz-plg-kf	wm-epg-cht	m/z	cht after bt, wm probably after plg

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
590436	5310225	11	SD-00-462	polygd qtz vn		metabasite	epg-plg-cht	act	op	relic plg microlites
592972	5310712	10	SD-00-463	msv		metabasite	epg-cht-plg	pum?-tit-cpx'		subgreenschist probab pumpelleyite
591117	5314223	21	SD-00-464		cb?	metaclastite	cht-wm-cb-qtz-plg	op		unsure if cb is primary or alteration
598860	5315510	11	SD-00-465	wpo		mafic metaclastite	cht-qtz-plg-cb	tit		possibly ragrade should be 71
598568	5313355	20	SD-00-466			metaconglomerate	cht-qtz-plg		op-cpx'-epg'	detrital epg, cpx,am nondescript matrix Prot?
479642	5366669	22	DA03-01a	wpo	wwm?	felsic metaporphyry	plg-wm-qtz		cb-cht-bt?-op-to	bt(?) is fract related, rusty wm/cht?
479642	5366669	11	DA03-01b	mpo agg, gsr		metabasite	plg-cht	qtz-tit	cb-act-epg-op	
479642	5366669	11	DA03-01c	ipo, gsr, hsz	icb	cb-cht phyllite/hsz	cht-plg-qtz?-cb vn		op-epg	cb vein fizzes(calcite), intense defm
484268	5371257	21	DA03-02a	wpo?		wm-cht metawacke	plg-qtz-wm-cht	kf	op-tit-ap	
484268	5371257	41	DA03-02b	mpo ll bdg		metamudstone	wm-qtz-cht-fp	cht-wm(rusty)	rusty cht not bt	
484284	5371224	11	DA03-02cl	msv		mafic metaconglomer	plg-cht-epg	qtz-cb	op-tit	no fabric in pebs/matrix, no pre-depos meta
482400	5368593	22	DA03-03a	mpo wm, cht	cb?	wm-cb-cht msiltstone	qtz-plg-wm-cb	cb	bt-op-to-ru	acic to overgrowth on to
481779	5368496	11	DA03-04a	msv + hsz	mcb	metabasite + hsz	plg-cht-wm-op-cb	qtz		transition from greenstone to hsz(71), no act
481336	5367380	21	DA03-05a	mpo wm, agg	mcb	wm-cht-cb metclastite	plg-qtz-wm-cb	cht	op-to-ru	cb aft plg
481252	5367349	21	DA03-06a	mpo wm, cht	mcb	cht-cb-wm metclastite	qtz-polg-cht-cb	wm	op	polygd cb-qtz vn, op-cht vn
483529	5369380	71	DA03-07a	m-ipo wm, cht	icb	cb-cht-wm phyllite	wm-cht-cb-qtz		ru-op	cb augen no fizz, once a vn?
483534	5369503	42	DA03-08a	ipo wm agg	mcb?	wm-cht-bt? phyllite	wm-qtz-plg	cht	bt?-op-ru-to-un	unsure about bt, possible but rusty cht possib
483534	5369503	42	DA03-08b	wpo	mcb?	wm-cht-cb metased	qtz-plg-wm-cht-cb		bt-op-to-ru-zi	one good grain of bt
482717	5369776	41	DA03-09a	mpo vvfgr		cht-wm slate	wm-cht-qtz-plg			very fine-grained mineral ID difficult
482717	5369776	21	DA03-09b	mpo agg, wm		cht-wm metawacke	qtz-plg-wm-cht	un	epg-op-ru-tit	NB no cb
482381	5368871	41	DA03-10a	mpo agg, wm		wm-cht slate	wm-qtz-cht-fp			too fgr for ID of everything
482381	5368871	41	DA03-10b	cross bdg?		metasiltstone	qtz-plg-wm-cht	opg	to-op	possible cross bdg, no cb
476549	5367781	21	DA03-11a	w-mpo wm agg	mwm	qf felsic metaporphyry	plg-wm-qtz-cht	cb	tit-op-ap	wmcb after plg
474767	5363425	71	DA03-12a	ipo agg hsz	cb?	cht-wm-cb phyllite	qtz-plg-cht-wm-cb			good eg of rusty cht, cb is cc,
474910	5363429	71	DA03-13a	ipo agg, cht	icb?	cb-cht phyllite/hsz	cb-plg-cht	qtz		similar to 12a, hsz+alt zone?
474921	5363478	11	DA03-14a	ipo act augen		mafic high strain zone	cht-act-plg(-ve)-epg		cb-tit	difficult to ID matrix
474954	5363448	22	DA03-15a	ipo cht wm	icb?	cht-cb-wm metclastite	plg-cht-qtz?-cb-wm		bt(relict)?-ru-to	relict bt would explain all that ru
474681	5363450	71	DA03-16a	ipo cht, agg	icb	cb-cht phyllite/hsz	cb-plg-cht	qtz	ru	what is context? at YK this = metaaltdbasite
478981	5368243	21	DA03-17a	wpo	cbwm	cht-cb-wm metclastite	plg"-qtz-cht-cb-wm	op	to	wmcbalt of plg, cb-bearing amygs?
478981	5368243	71	DA03-17b	wpo agg	icb?	plg-cht-qtz-cb-wm	un		bt?	probably rusty cht
478995	5368860	21	DA03-18a	msv, hsz, cren	icb?	cht-wm marble/vein?	cb-wm-cht		op-qtz-ru	ru in fol-cren cht hsz that cuts msv rk
480552	5365923	71	DA03-19a	mpo	icb?	cht-wm marble/vein?	cb-wm-cht		qtz-op-ru	
479812	5365929	42	DA03-20a	mpo cht wm, ag	icb?	wm-cht-bt-cb phyllite	wm-cht-cb		op-plg-qtz-bt	incip bt structurally controled, hmm?
477095	5369577	11	DA03-21a	mpo cht, agg	mcb?	cht-epg-cb metaclastit	plg-cht-cb-epg	qtz-op	am-tit	mcblaltd basite or mafic metaclastite
477143	5368541	21	DA03-22a	wpo, cht wm	icb?	cb-wm-cht mclastite	cb-wm-qtz-cht	plg?	op-ru	zoned cb bleb
477362	4369277	21	DA03-24b	mpo wm agg	wmcb	mcbaltd fel mporphyry	plg"-qtz-wm-cb		op-tit?-ru	wmcb altd plg, no cht but wm-femg cb ok 21

xeast83	ynort83	ragrd	samnum	defm	alter	rkpetrog	moreten	onetoten	lessone	notes
491805	5374637	71	DA03-25a	cht hsz+flowfabric	mcb	felsic metaporphyry	polg	cb-cht(matrix,vn)	ru	cht hsz cuts fp fabric(ign?)
491797	5374601	71	DA03-26a	msv	mcb?	cht-cb msdst/dfmd vn	qtz-cb-cht		ru	cb porphyroblasts in qtz-rich msdst/dfmd vn
491967	5374676	71	DA03-27a	mpo cht, agg	mcb?	cht-plg-cb rock	plg-cht-cb	qtz-ru	op	unsure about protolith, not mumaf.
492048	5374655	71	DA03-28a	mpo clasts, cht	mcb?	heterolit metaconglom	cb-cht-qtz-plg	op	to (golden brn)	cb-cht, fgr qtz, qfp clasts, one meta/defm
492063	5374632	21	DA03-29a	mpo cht	mcb?	cht-cb metawacke	qtz-plg-cht-cb		op-ru-to-m/z	round qtz-fp-cb agg, no wm
492090	5374483	41	DA03-30a	mpo wm, agg	wcb?	wm-cht metasiltstone	qtz-plg-wm	cht-cb	op-ru-to	cb distinct irreg grains/porphs
492090	5374483	41	DA03-30b	mpo ll lyr, cren	wcb?	wm-cht slate/phyllite	qtz-wm-plg?-ps(wm)	cb-cht	op-to	wm pseudos aft?
493068	5374928	11	DA03-31a	wpo agg	mcb?	cb-cht metabasite/intm	plg-cht-cb	epg	op-qtz-tit	plg-rich=intm?, cb in matrix, vn (fizzy)
493100	5374906	41	DA03-32a	mpo ll lyr		wm-cht slate(silty)	wm-qtz-plg	cht	op-to	cb poik/boudin(qtz-cb-wm-plg-cht)
493057	5374908	21	DA03-33a	w-mpo	cb?	heterol metaconglom	plg-qtz-cht-wm-cb	op		foliated pebs but ll mpo, could be post dep po
493032	5374860	41	DA03-34a	mpo ll lyr	cb?	wm-cb-cht phyllite	wm-qtz-plg-cb	cht	op-to-ru	cb poiks all through rk, not likely detrital
480478	5366122	21	DA03-35a	mpo wm agg		cht-wm metaporphyry	qtz-plg-wm-cht	to	rusty cht not bt	zoned to.
479454	5366432	21	DA03-36a	msv		stp cht metaporphyry	fp-qtz	wm-cht	stp-act-tit-op	
479454	5366432	32	DA03-36b			metaultramafite	tr-cht	tit	stp-op-qtz-fp	stp is a late phase here
479454	5366432	42	DA03-36c	m-ipo cht, bt	cb?	bt-cht-cb phyllite	qtz-fp-bt-cht		not all bt ll po	
479637	5366680	71	DA03-37a	mpo cht agg	cb?	cht-cb phyllite	qtz-plg-cht-cb(cc)	tit		mafic phyllite, cb lenticles, individ grains
479637	5366680	71	DA03-37b	mpo cht	mcb?	cht-cb phyllite	qtz-plg-cht-cb			
479532	5366483	21	DA03-38a	intense defm		stp qf metaporphyry	fp-qtz		cht-wm-stp-op	
537772	5373283	22	DA04-1b	ipo clasts, agg		felsic mlastite/mylonite	fp-qtz	epg-act-op(gra?)	bt(in vein)	very high strain
478215	5365920	11	DA04-2b	msv-mpo local		mafic metaclastite	epg-act		cb	
475265	5371130	11	DA04-3a	mpo cht, epg		cht schist(hsz?)	cht-'op''/tit(brn fuzzy ag)	plg-qtz-cb	epg-op	possible high strain zone in metabasite
476650	5368645	21	DA04-4a	mpo cht wm, ag	wcb?	cht-wm metaclastite	cht-wm-plg-qtz-op	cb		
586630	5333325	71	DA04-6a	wpo clasts	mcb?	heterolit metaconglom	fp-plg-un-cb-cht-qtz	wm(fp clast)-op		un=welround vfgr pebs of?, no wm in matrix
475920	5369210	11	DA04-10a	mpo cht, cb vn	mcb?	intm metaclastite	cht-plg-qtz-cb		op-tit-epg	good metaclastic txt, mcbalt possible
475920	5369210	21	DA04-10b	mpo wm cht	cb?	felsic metaclastite	wm-cht-qtz-plg		op-zi-ap	cb looks premetamorphic, so pre/syn meta alt
475920	5369210	41	DA04-10c	ipo asym qtz		sandy metasiltstone	wm-qtz	cht-plg?	op (gra, un)-zi	some asymm to qtz 'clasts?wrt mpo
455780	5382160	11	DA04-11a	wpo	wcb?	metabasite	plg-cht	cb-tit-qtz	epg-op	cb as euhedral grains, tit also
455910	5382280	22	DA04-12a	mpo agg		bt fels metaclastite	fp-qtz-bt	cht-tit	cb-op	looks higher grade than 11a, lots bt

Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
LENGTH					
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
AREA					
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
VOLUME					
1 cm^3	0.061 023	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m^3
CAPACITY					
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
MASS					
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 90**	t
CONCENTRATION					
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.

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20 Victoria Street
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